V18825

Zentralwerkstatt und
Ersatzteildepot
für ORION-Produkte

Schwalbe
Service & Versand GmbH

Postfach 10 10 26
63264 Dreieich
Max-Planck-Str. 20
63303 Dreieich

☎ Ersatzteil-Bestellung: (0 61 03) 39 99-95
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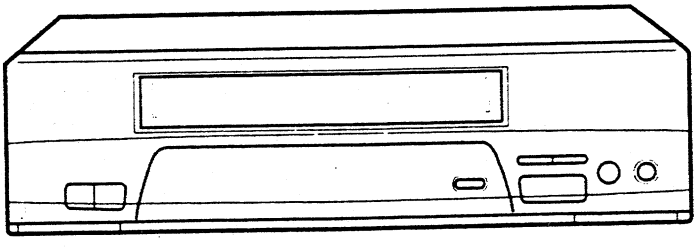
Service Manual

Nachdruck bzw. Kopieren dieser Unterlagen ist grundsätzlich verboten!

ORION

VH-1444 VH-1298 (ohne VPS)
VR-2970 VN-299
VR-2970 A

VIDEO CASSETTE RECORDER



VHS PAL

Änderungen vorbehalten!

Printed in Germany

Chassis Code: A

Bestell-Nr.: 7721

SPECIFICATIONS

Power Source :	AC230V/50Hz	**Audio Track :**	1 track
Power Consumption :	Approx. 19W	**Tape Format :**	12.65mm high density tape
Operating Temperature :	5℃ to 40℃	**RF Output Channel :**	36 (± 4) channel
Television System :	CCIR : 625 lines,50 fields	**Tape Speed:**	SP : 23.39mm/s
	PAL color signal	**F.FWD/REW Time :**	Approx. 2 minutes 30 seconds
Video Recording System :	2 rotary heads, helical		(with E-180 Cassette Tape)
	scanning system	**Input Level :**	VIDEO : 1.0Vp-p, 75 ohm unbalanced
	Luminance : FM azimuth recording		AUDIO : 500mV, 50k ohm unbalanced
	Color signal : PAL recording	**Output Level :**	VIDEO : 1.0Vp-p, 75 ohm unbalanced
Heads:	Video : 2 rotary heads		AUDIO : 500mV, 1k ohm unbalanced
	Erase : 1 full track erase head	**Weight :**	3.7 Kg
	Audio/Control : 1 stationary head	**Dimension :**	355(W) × 92(H) × 275.5(D) mm

Design and specification are subject to change without notice.

SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.
Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a ⚠ mark, the designated parts must be used.

3. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

4. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the CHASSIS CODE.)

1. MODEL NUMBER and CHASSIS CODE
   You can find it in the back of your unit.
2. PART NO. and DESCRIPTION
   You can find it in your SERVICE MANUAL.

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DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS

1-1: TOP CABINET AND FRONT CABINET (Refer to Fig. 1-1)

1. Remove the 4 screws ①.
2. Remove the Top Cabinet and Angle Deck Back in the direction of arrow (A).
3. Disconnect the following connector: (CP651 3 pins).
4. Unlock the 2 supports ②.
5. Remove the Front Cabinet in the direction of arrow (B).
6. Remove the 2 screws ③ and remove the Operation PCB.

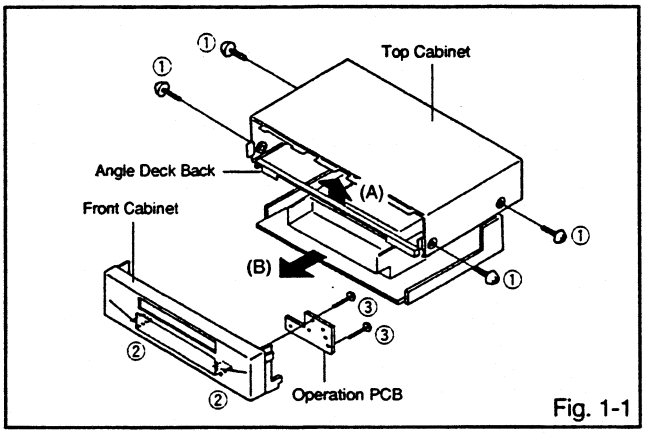


Fig. 1-1

1-2: LOCATION OF P.C. BOARDS (Refer to Fig. 1-2)

CAUTION: BEFORE ATTEMPTING TO REMOVE OR REPAIR ANY PCB, UNPLUG THE POWER CORD FROM THE AC SOURCE.

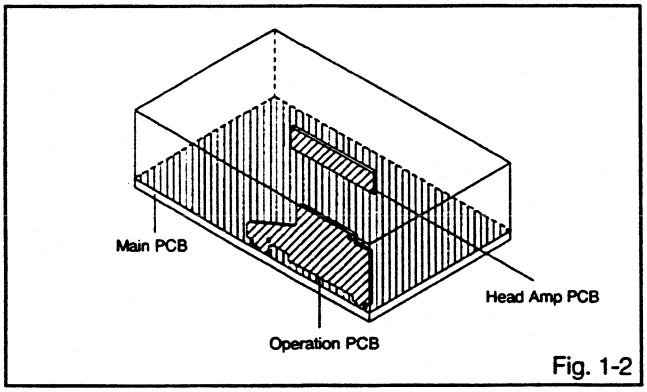


Fig. 1-2

1-3: BOTTOM CHASSIS (Refer to Fig. 1-3)

1. Remove the 2 screws ①.
2. Unlock the 2 supports ②.
3. Remove the Bottom Chassis in the direction of arrow.

NOTE

AC Cord must be removed from the AC Jack before PCB and Deck Chassis can be removed.

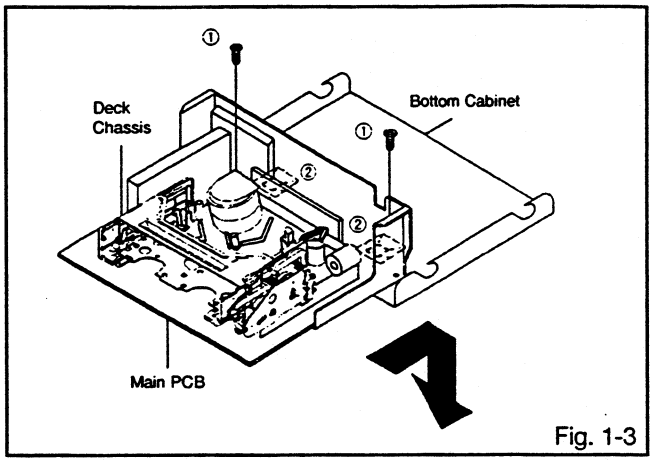


Fig. 1-3

1-4: FLAP (Refer to Fig. 1-4)

1. Open Flap to 90° and flex in direction of arrow (A), at the same time slide in direction of arrow (B).
2. Then lift in direction of arrow (C).

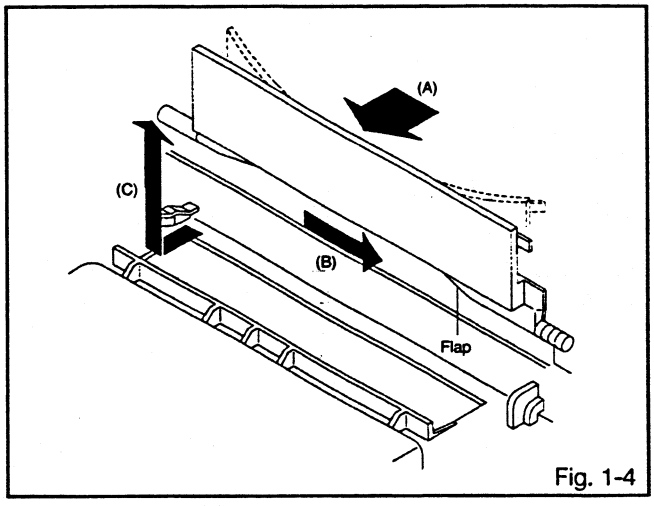


Fig. 1-4

1-5: MAIN PCB (Refer to Fig. 1-5)

1. Remove the 3 screws ①.
2. Remove the screw ②.
3. Disconnect the 2 connectors: (CP1001 20 pins and CP4001 16 pins) and remove the Deck Chassis in the direction of arrow.

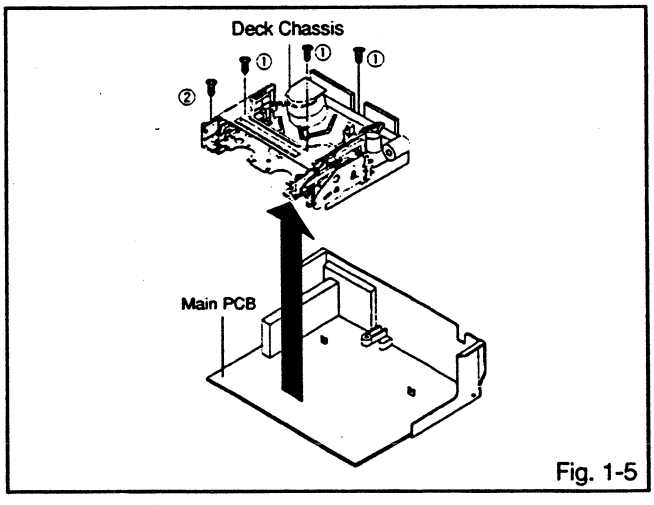


Fig. 1-5

DISASSEMBLY INSTRUCTIONS

1-6: MAIN PCB AND BACK PANEL (Refer to Fig. 1-6)

1. Remove the 2 screws ①.
2. Remove the Main PCB in the direction of arrow.

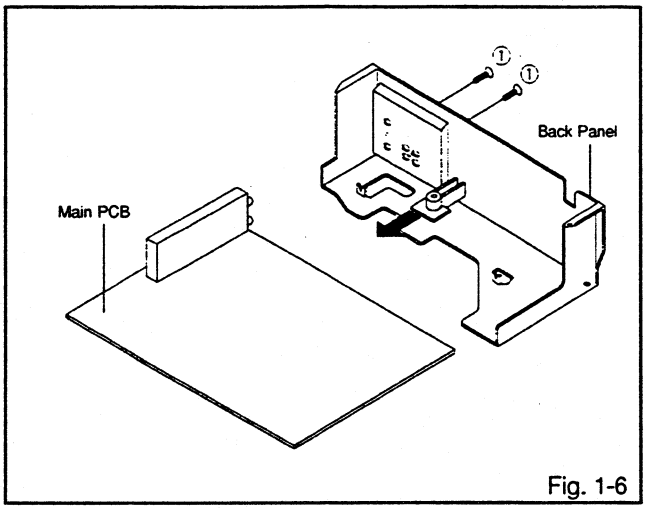


Fig. 1-6

1-7: CHASSIS SECTION AND UNIT ASS'Y (Refer to Fig. 1-7)

1. Remove the screw ①.
2. Remove the screw ②.
3. Remove Unit Ass'y in the direction of arrow (A).

NOTE

When installing the Unit Ass'y, align the timing marks and pull the Cassette Holder Ass'y in the direction of arrow (B).

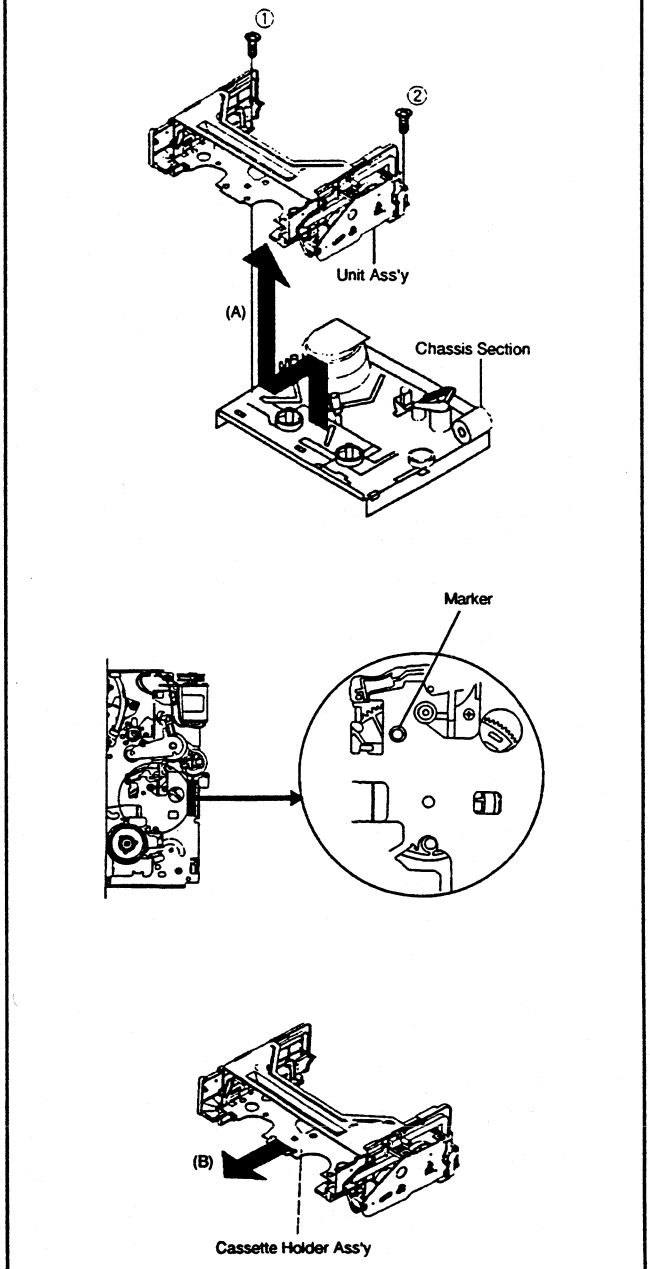


Fig. 1-7

DISASSEMBLY INSTRUCTIONS

2. REMOVAL OF DECK PARTS

2-1: LINK GEAR (R) / CLUTCH GEAR (Refer to Fig. 2-1)

1. Unlock the support ①.
2. Remove the BOT Sensor Cover and BOT Reflector.
3. Unlock the 3 supports ②.
4. Remove the Side Bracket R2 and Spring Earth.
5. Remove the Flap Lever, Link Gear (R) , Cam Gear Ass'y and BOT Lever.

NOTE

When installing the Link Ass'y and Link Gear (R), align the timing Marks.

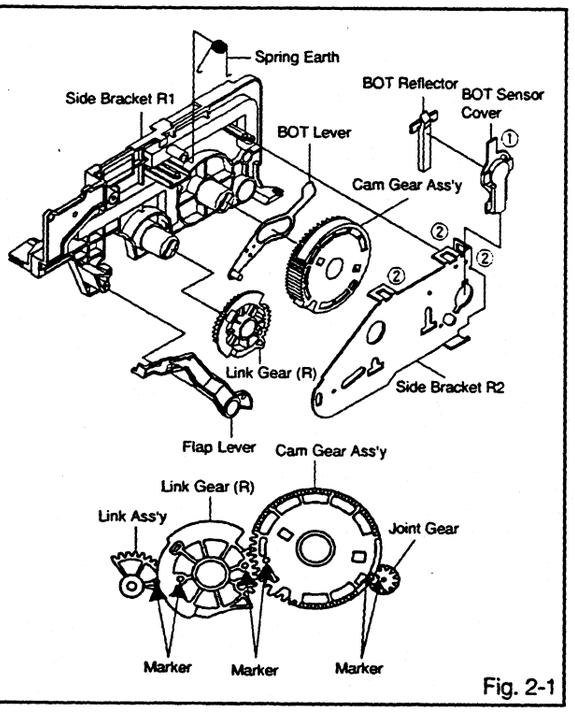


Fig. 2-1

2-2: TOP BRACKET / TAPE PIECE GUIDE (Refer to Fig. 2-2)

1. Unlock the 4 supports ①.
2. Remove the Top Bracket.
3. Remove the Side Bracket R1 and Side Bracket L.
4. Unlock the support ②.
5. Remove the Joint Gear.
6. Remove the Bracket R Spring.

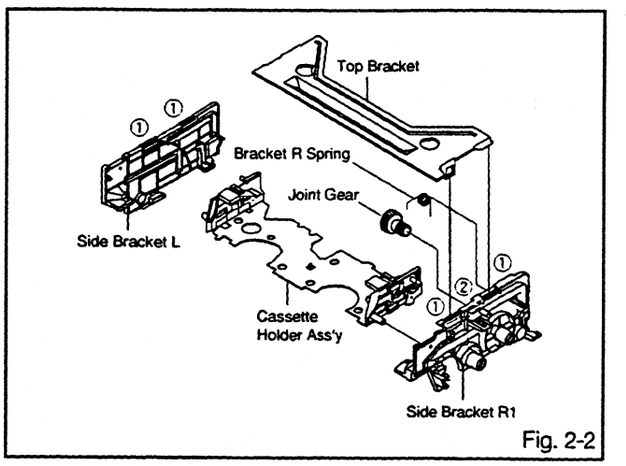


Fig. 2-2

2-3: LINK ASS'Y (Refer to Fig. 2-3)

1. After removing in the direction (A) of Link Ass'y, remove the Link Ass'y in the direction (B).

NOTE

Install the (B) first, then install the (A).

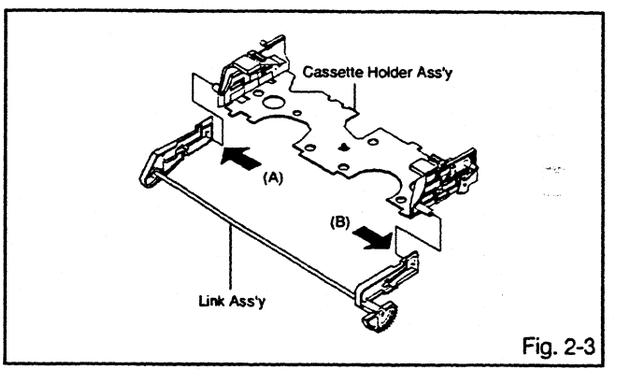


Fig. 2-3

2-4: CASSETTE SIDE R (Refer to Fig. 2-4)

1. Unlock the 2 supports ①.
2. Remove the Cassette Side R.
3. Remove the Pack Spring.
4. Remove the Locker Spring.
5. Unlock support ②.
6. Remove the Locker R.

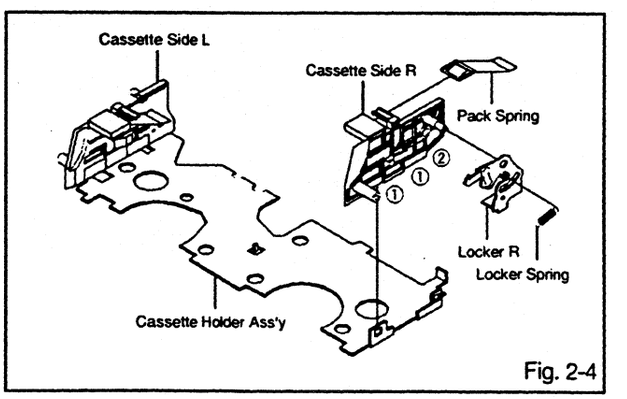


Fig. 2-4

DISASSEMBLY INSTRUCTIONS

2-5: CASSETTE SIDE L (Refer to Fig. 2-5)

1. Unlock the 2 supports ①.
2. Remove the Cassette Side L.
3. Remove the Pack Spring.
4. Remove the Locker Spring.
5. Unlock the support ②.
6. Remove the Locker L.

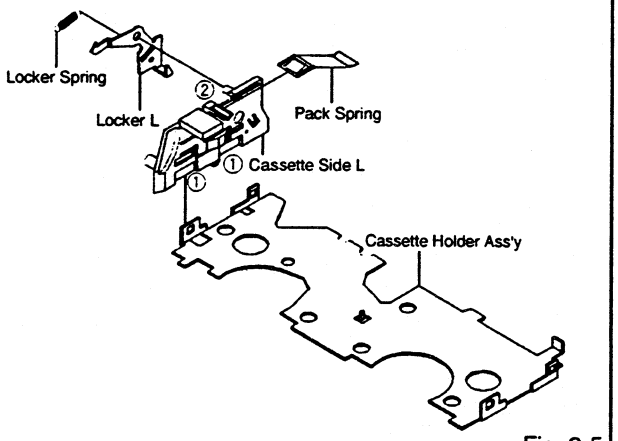


Fig. 2-5

2-6: BRAKE BRACKET (Refer to Fig. 2-6)

1. Remove the Main Brake Spring, S-S Brake Spring, Joint Arm Spring and T-S Brake Spring.
2. Remove the 2 screws ①.
3. Remove the screw ②.
4. Remove the Brake Bracket.
5. Remove the Sub Brake S, Sub Brake T, Main Brake S Ass'y and Main Brake T Ass'y.
6. Remove the Joint Arm.
7. Remove the Reflector LED 2.

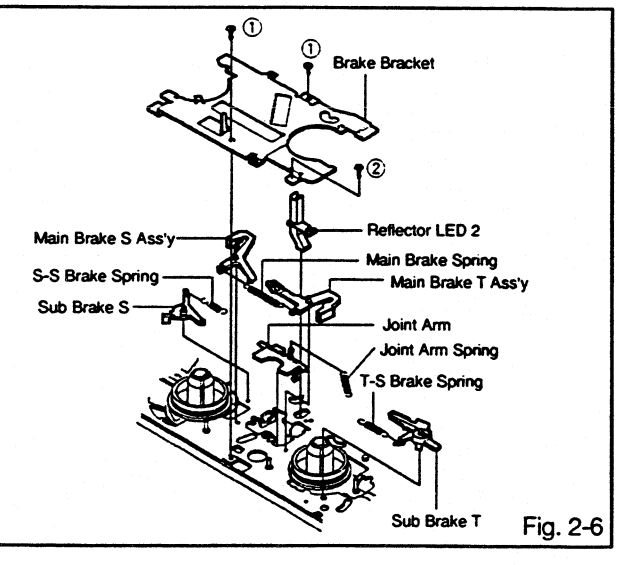


Fig. 2-6

2-7: TENSION BAND (Refer to Fig. 2-7)

1. Remove the Tension Arm Spring 1.
2. Remove the Tension Arm Spring 2.
3. Remove the Tension Adjust.
4. Remove the Tension Arm Ass'y.
5. Remove the Tension Band Ass'y.
6. Remove the Tension Lever 2 Ass'y.

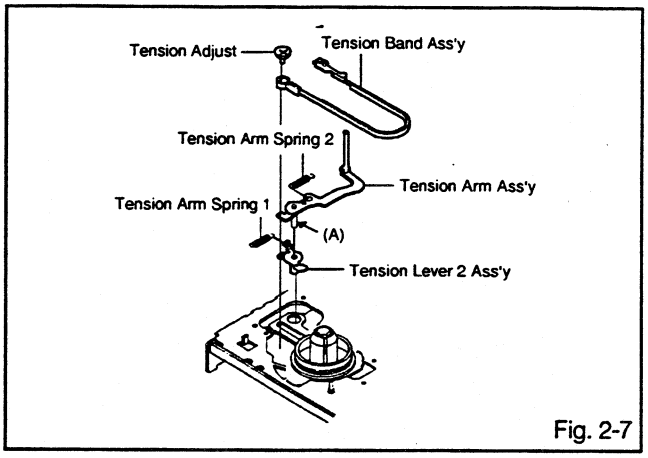


Fig. 2-7

NOTE

1. Install the Tension Band Ass'y without twisting it.
2. Oil (kyoudo oil slaidasu #150) the area marked with A in **Fig. 2-7.**

2-8: REEL DISK (Refer to Fig. 2-8)

1. Remove the Reel Disk S and Reel Disk T.
2. Remove the 2 polyslider washers.

NOTES

1. Installation of Reel Disk after performing step 1, 2 and 3 in section 2-7 of DISASSEMBLY INSTRUCTIONS.
2. The Height Adjustment washers are sometimes attached to the back of the Reel Disk.
3. Clean the Reel Disk Shaft and put in height adjusting washers.
4. Be careful not to damage the Tension Band Ass'y at the time of removal and installation.
5. Be careful not to scratch the Reel Disk Shaft with the polyslider washer or the tool at the time of removal and installation.
6. After oiling (Kyoudo oil slaidasu #150) the Reel Disk Shaft, install the new Reel Disk S and Reel Disk T again.
7. After installation, adjust the height of the Reel Disk. **(Refer to item 1-1 of MECHANICAL ADJUSTMENTS)**
8. After installation, adjust and confirm the tension post position. **(Refer to item 1-2 of MECHANICAL ADJUSTMENTS)**

DISASSEMBLY INSTRUCTIONS

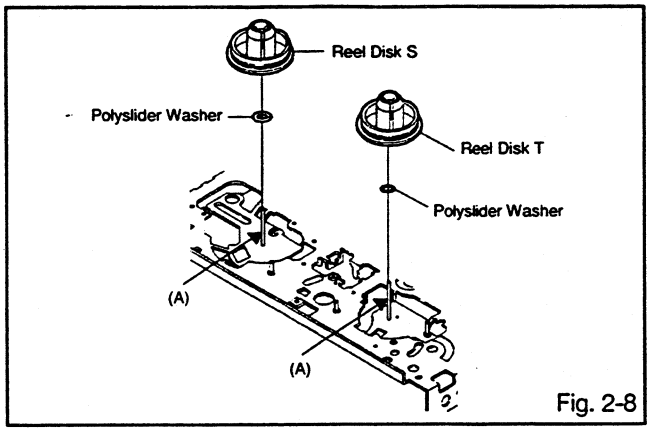


Fig. 2-8

2-9: PINCH ROLLER / CASSETTE OPENER (Refer to Fig. 2-9)

1. Unlock the support ①.
2. Remove the Pinch Roller.
3. Remove the screw ②.
4. Unlock the 2 supports ③.
5. Remove the Cassette Opener.
6. Remove the Spring P5 and Arm P5 Ass'y.
7. Remove the Cam Gear and Cam Pinch Roller.
8. Remove the polyslider washer and Cam P5.

NOTES

1. Do not touch the Pinch Roller. (Use gloves.)
2. When installing the Cam P5, Cam Pinch Roller and Cam Gear, align the timing marks.

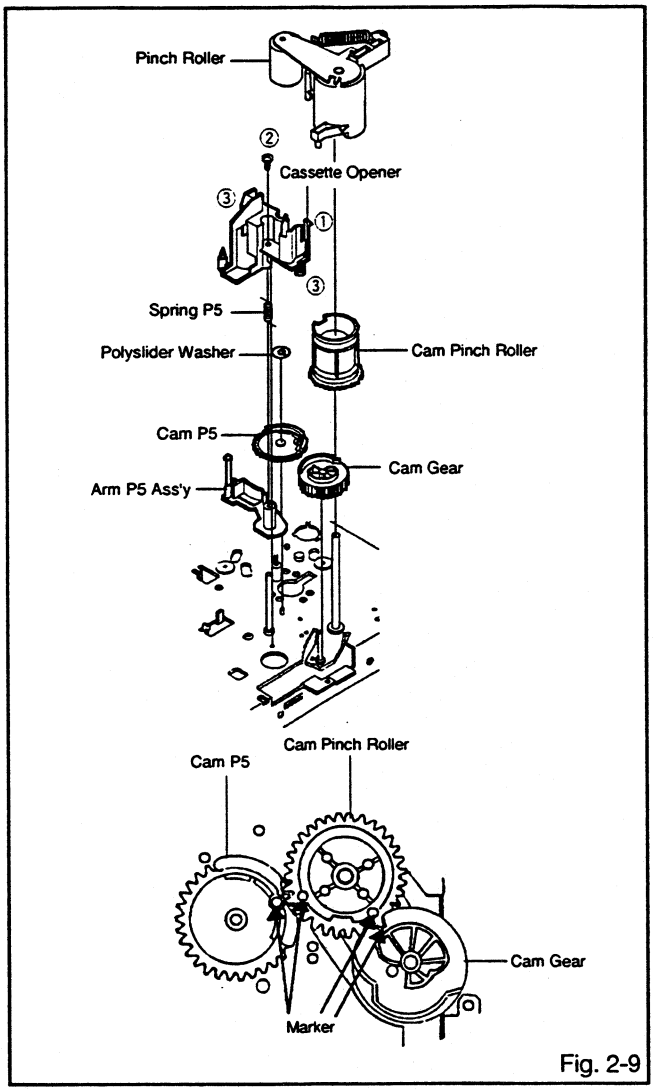


Fig. 2-9

2-10: AUDIO CONTROL HEAD (Refer to Fig. 2-10)

1. Disconnect the connector: (CP4106 6 pins) on the Head Amp PCB.
2. Remove the 3 screws ①.
3. Remove the 3 Audio Control Head Springs.
4. Remove the Audio Control Head.

NOTES

1. Do not touch the head by any means when replacing the Audio Control Head. (Use gloves.)
2. After replacement, confirm the following adjustments.
   a. MECHANICAL ADJUSTMENTS: ITEM 2-2
   b. MECHANICAL ADJUSTMENTS: ITEM 2-3

DISASSEMBLY INSTRUCTIONS

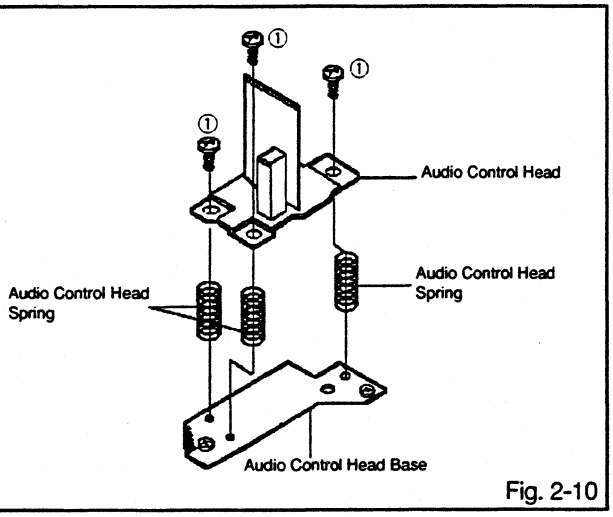


Fig. 2-10

2-11: CYLINDER UNIT (Refer to Fig. 2-11)

1. Disconnect the following connectors:
   (CP4101 4 pins and CP4102 5 pins).
2. Remove the Joint Screw, then remove the Azimuth Spring.
3. Remove the 2 screws ①, then remove the Polyslider Washer and Cylinder Unit from the Main Chassis.

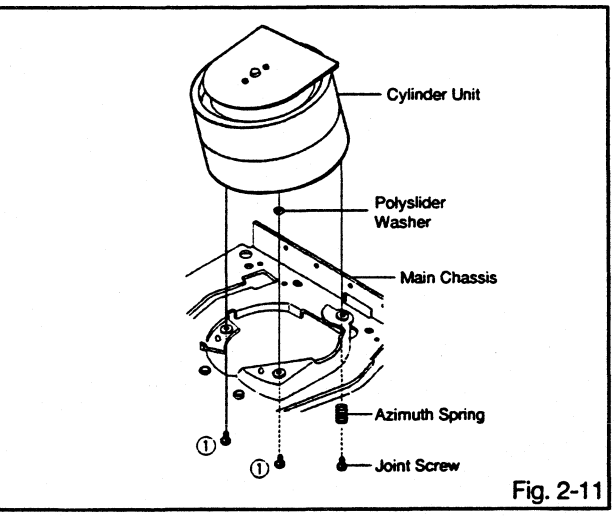


Fig. 2-11

2-12: PLATE BOTTOM (Refer to Fig. 2-12)

1. Remove the Capstan Belt.
2. Remove the 2 screws ①.
3. Remove the 3 screws ②.
4. Remove the Mode Switch.
5. Remove the Tension Lever Spring.
6. Remove the Plate Bottom.

NOTE

When installing the Mode Switch, align the timing position.

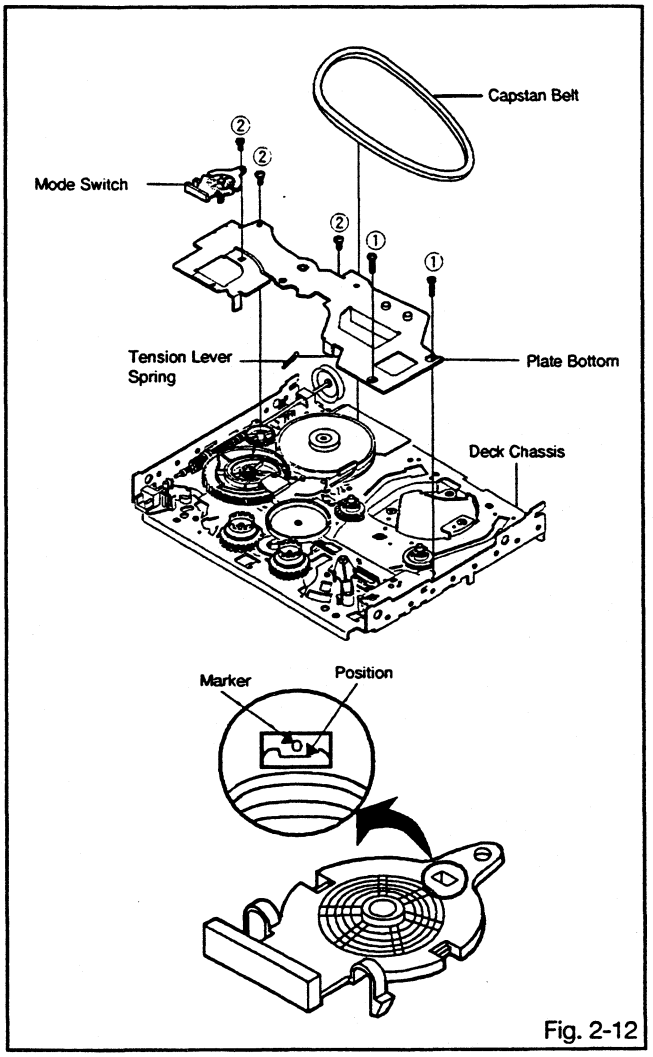


Fig. 2-12

2-13: CENTER PULLEY (Refer to Fig. 2-13)

1. Remove the polyslider washer ①.
2. Remove the Center Pulley.
3. Remove the polyslider washer ②.
4. Remove the Center Pulley Spring.
5. Remove the Idler Arm Ass'y.
6. Remove the 2 polyslider washers ③.
7. Remove the Clutch Gear T Ass'y and Clutch Gear S Ass'y.

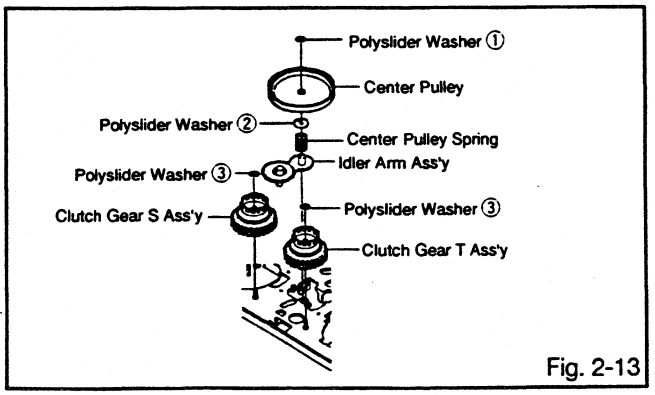


Fig. 2-13

DISASSEMBLY INSTRUCTIONS

2-14: MAIN CAM (Refer to Fig. 2-14)

1. Remove the Loading Lever.
2. Remove the Main Brake Lever.
3. Remove the Capstan Brake Spring.
4. Remove the Capstan Brake Ass'y.
5. Remove the Main Rod Spring.
6. Remove the Tension Holder.
7. Remove the Tension Lever.
8. Remove the Main Cam.
9. Remove the Middle Gear.
10. Remove the Main Rod Ass'y.

NOTES

1. When installing the Main Rod Ass'y, install side (B) first, then install side (A).
2. When installing the Loading Lever, align the timing marks.

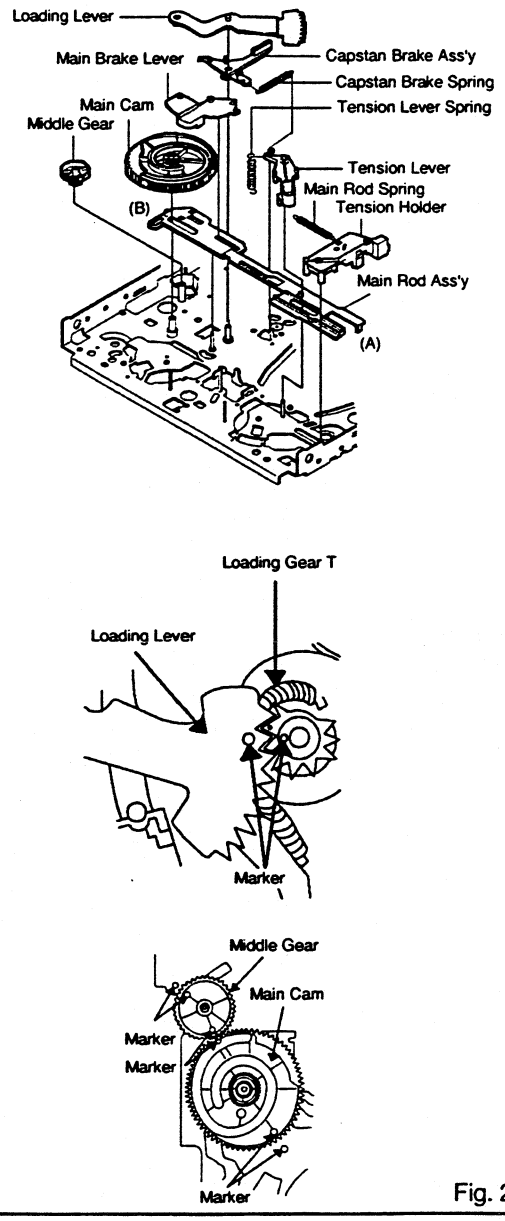


Fig. 2-14

2-15: CAPSTAN DD UNIT (Refer to Fig. 2-15)

1. Remove the screw ①.
2. Disconnect the CP4105 9 pins.
3. Remove the 3 screws ②.
4. Remove the Capstan DD Unit.

NOTE

Use the specified screw to hold the Capstan DD Unit.

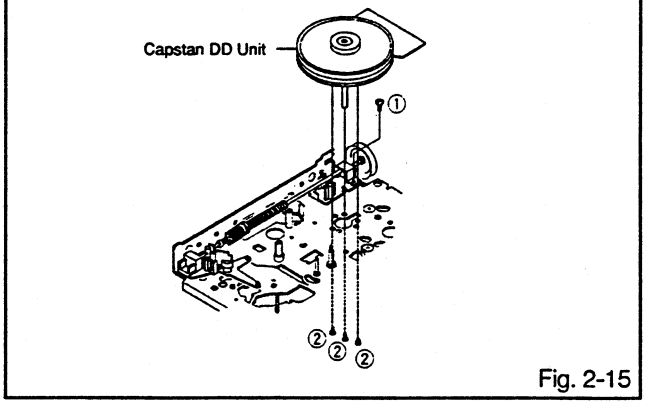


Fig. 2-15

2-16: INCLINED T ASS'Y / INCLINED S ASS'Y (Refer to Fig. 2-16)

1. Remove the 2 Slider Loadings.
2. Remove the Inclined T Ass'y and Inclined S Ass'y.
3. Remove the Loading Gear T Ass'y.
4. Remove the Loading Gear S Ass'y.

NOTE

When installing the Inclined T Ass'y and Inclined S Ass'y, align the timing marks.

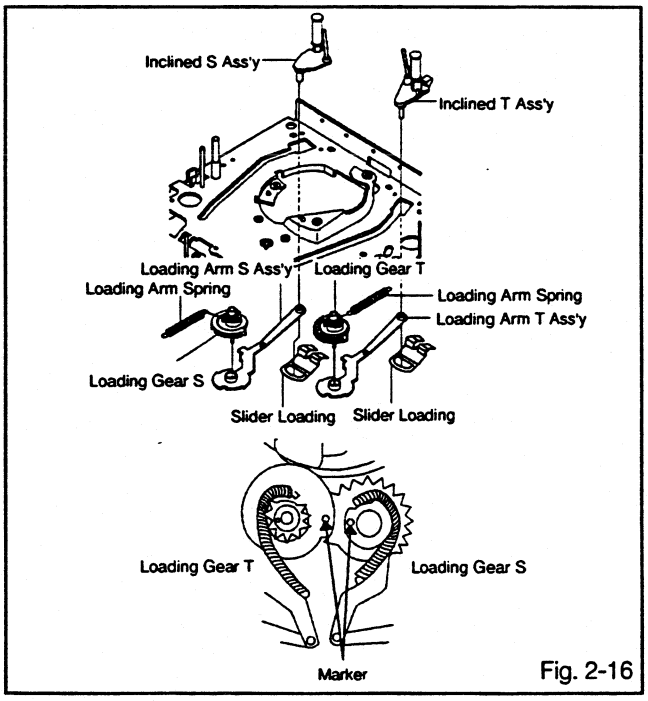


Fig. 2-16

KEY TO ABBREVIATIONS

A	A/C	:	Audio/Control
	ACC	:	Automatic Color Control
	AE	:	Audio Erase
	AFC	:	Automatic Frequency Control
	AFT	:	Automatic Fine Tuning
	AFT DET	:	Automatic Fine Tuning Detect
	AGC	:	Automatic Gain Control
	AMP	:	Amplifier
	ANT	:	Antenna
	A.PB	:	Audio Playback
	APC	:	Automatic Phase Control
	ASS'Y	:	Assembly
	AT	:	All Time
	AUTO	:	Automatic
	A/V	:	Audio/Video
B	BGP	:	Burst Gate Pulse
	BOT	:	Beginning of Tape
	BPF	:	Bandpass Filter
	BRAKE SOL	:	Brake Solenoid
	BUFF	:	Buffer
	B/W	:	Black and White
C	C	:	Capacitance, Collector
	CASE	:	Cassette
	CAP	:	Capstan
	CARR	:	Carrier
	CH	:	Channel
	CLK	:	Clock
	CLOCK (SY-SE)	:	Clock (Syscon to Servo)
	COMB	:	Combination, Comb Filter
	CONV	:	Converter
	CPM	:	Capstan Motor
	CTL	:	Control
	CYL	:	Cylinder
	CYL-M	:	Cylinder-Motor
	CYL SENS	:	Cylinder-Sensor
D	DATA (SY-CE)	:	Data (Syscon to Servo)
	dB	:	Decibel
	DC	:	Direct Current
	DD Unit	:	Direct Drive Motor Unit
	DEMOD	:	Demodulator
	DET	:	Detector
	DEV	:	Deviation
E	E	:	Emitter
	EF	:	Emitter Follower
	EMPH	:	Emphasis
	ENC	:	Encoder
	ENV	:	Envelope
	EOT	:	End of Tape
	EQ	:	Equalizer
	EXT	:	External
F	F	:	Fuse
	FBC	:	Feed Back Clamp
	FE	:	Full Erase
	FF	:	Fast Forward, Flipflop
	FG	:	Frequency Generator
	FL SW	:	Front Loading Switch
	FM	:	Frequency Modulation
	FSC	:	Frequency Sub Carrier
	FWD	:	Forward
G	GEN	:	Generator
	GND	:	Ground
H	H.P.F	:	High Pass Filter
	H.SW	:	Head Switch
	Hz	:	Hertz
I	IC	:	Integrated Circuit
	IF	:	Intermediate Frequency
	IND	:	Indicator
	INV	:	Inverter
K	KIL	:	Killer
L	L	:	Left
	LED	:	Light Emitting Diode
	LIMIT AMP	:	Limiter Amplifier
	LM, LDM	:	Loading Motor
	LP	:	Long Play
	L.P.F	:	Low Pass Filter
	LUMI.	:	Luminance
M	M	:	Motor
	MAX	:	Maximum
	MINI	:	Minimum
	MIX	:	Mixer, mixing
	MM	:	Monostable Multivibrator
	MOD	:	Modulator, Modulation
	MPX	:	Multiplexer, Multiplex
	MS SW	:	Mech State Switch
N	NC	:	Non Connection
	NR	:	Noise Reduction
O	OSC	:	Oscillator
	OPE	:	Operation
P	PB	:	Playback
	PB CTL	:	Playback Control
	PB-C	:	Playback-Chrominance
	PB-Y	:	Playback-Luminance
	PCB	:	Printed Circuit Board
	P. CON	:	Power Control
	PD	:	Phase Detector
	PG	:	Pulse Generator
	P-P	:	Peak-to Peak
R	R	:	Right
	REC	:	Recording
	REC-C	:	Recording-Chrominance
	REC-Y	:	Recording-Luminance
	REEL BRK	:	Reel Brake
	REEL S	:	Reel Sensor
	REF	:	Reference
	REG	:	Regulated, Regulator
	REW	:	Rewind
	REV, RVS	:	Reverse
	RF	:	Radio Frequency
	RMC	:	Remote Control
	RY	:	Relay
S	S. CLK	:	Serial Clock
	S. COM	:	Sensor Common
	S. DATA	:	Serial Data
	SEG	:	Segment
	SEL	:	Select, Selector
	SENS	:	Sensor
	SER	:	Search Mode
	SI	:	Serial Input
	SIF	:	Sound Intermediate Frequency
	SO	:	Serial Output
	SOL	:	Solenoid
	SP	:	Standard Play
	STB	:	Serial Strobe
	SW	:	Switch

KEY TO ABBREVIATIONS

S	**SYNC**	:	Synchronization
	SYNC SEP	:	Sync Separator, Separation
T	**TR**	:	Transistor
	TRAC	:	Tracking
	TRICK PB	:	Trick Playback
	TP	:	Test Point
U	**UNREG**	:	Unregulated
V	**V**	:	Volt
	VCO	:	Voltage Controlled Oscillator
	VIF	:	Video Intermediate Frequency
	VP	:	Vertical Pulse, Voltage Display
	V.PB	:	Video Playback
	VR	:	Variable Resistor
	V.REC	:	Video Recording
	VSF	:	Visual Search Fast Forward
	VSR	:	Visual Search Rewind
	VSS	:	Voltage Super Source
	V-SYNC	:	Vertical-Synchronization
	VT	:	Voltage Tuning
X	**X'TAL**	:	Crystal
Y	**Y/C**	:	Luminance/Chrominance

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage. Unless maintenance is properly carried out, the following service intervals may be quite shortened as harmful effects may be had on other parts. Also, long term storage or misuse may cause transformation and aging of rubber parts.

Time / Parts Name	500 hours	1,000 hours	1,500 hours	2,000 hours	3,000 hours	Notes
Audio Control Head	■	■	■	■	■	Clean those parts in contact with the tape.
Full Erase Head	■	■	■	■	■	
Loading Motor Belt		■		●		Clean the rubber, and parts which the rubber touches.
Reel Belt		■		●		
Pinch Roller	■	■	■	■	■ ●	
Capstan DD Unit					●	
Loading Motor					●	
Tension Band					●	
Capstan Shaft	■	■	■	■	■	
Tape Running Guide Post	■	■	■	■	■	Replace when rolling becomes abnormal.
Cylinder Unit	■	■ ●	■	■ ●	■ ●	Clean the Head.

● : Replace ■ : Clean

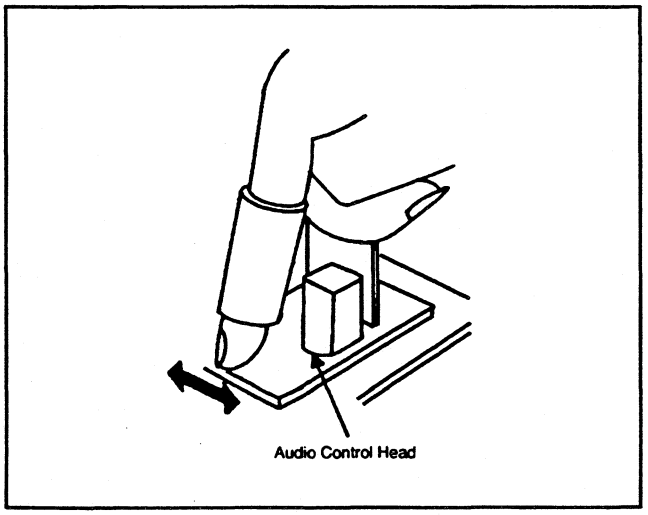
CLEANING

NOTE

- After cleaning the heads with isopropyl alcohol, do not run a tape until the heads dry completely. If the heads are not completely dry and alcohol gets on the tape, damage may occur.

1. AUDIO CONTROL HEAD

- Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol and clean the audio control head by wiping it horizontally. Clean the full erase head in the same manner. **(Refer to the figure below)**



2. TAPE RUNNING SYSTEM

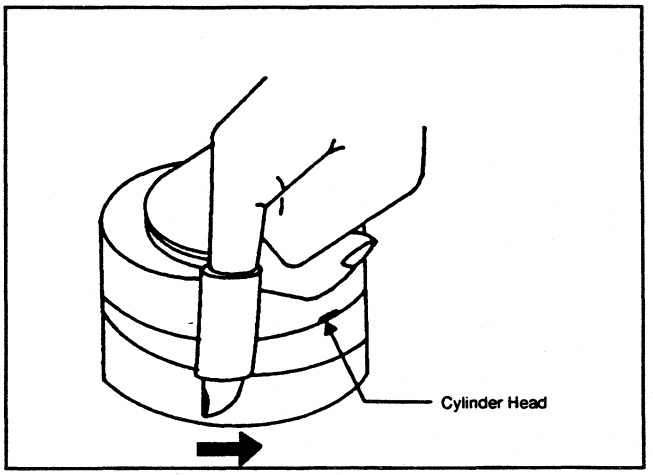
- When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

3. CYLINDER

- Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol. Hold it to the cylinder head softly. Turn the cylinder head counterclockwise to clean it (in the direction of the arrow). **(Refer to the figure below)**

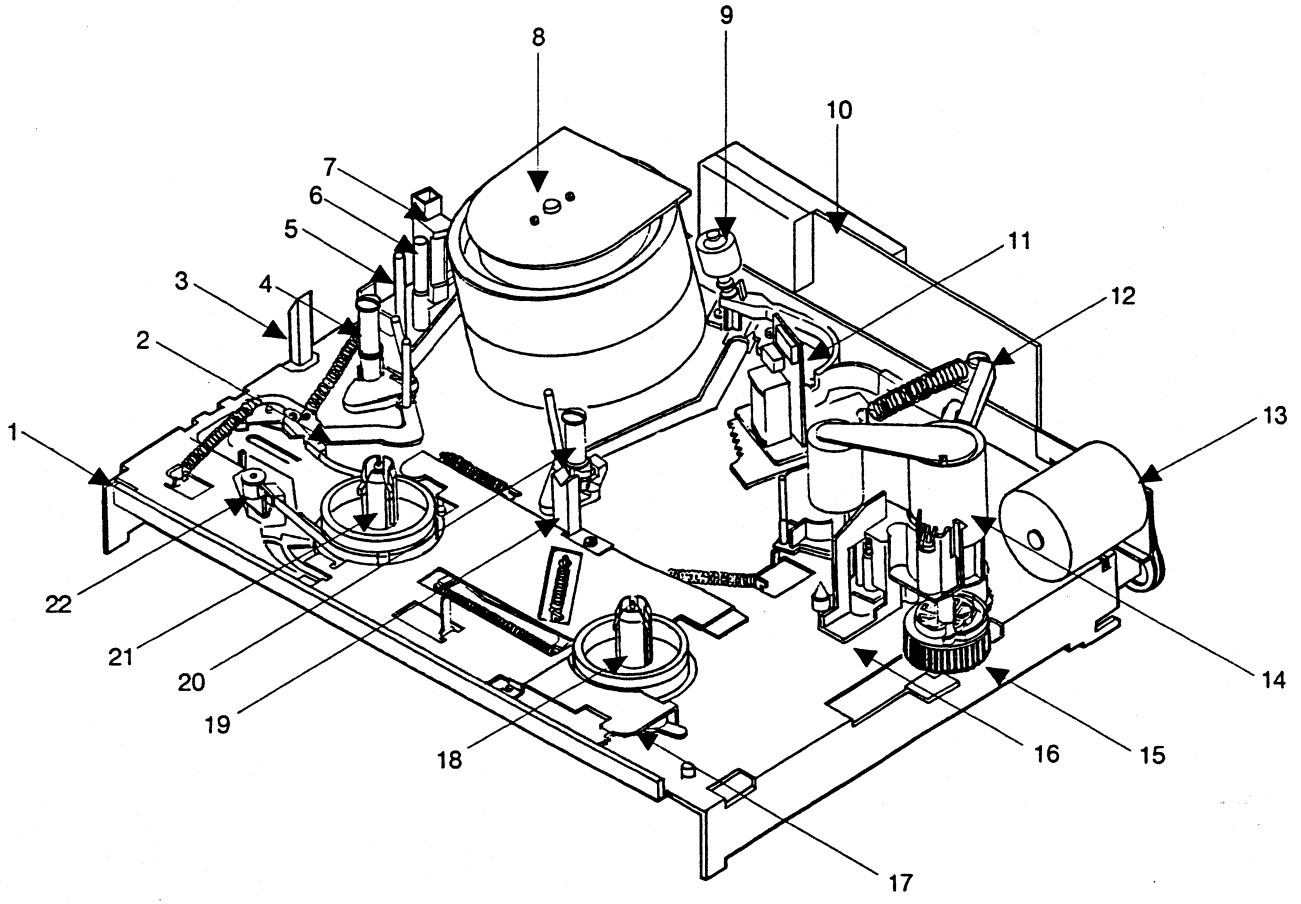
NOTE

Do not exert force against the cylinder head. Do not move the chamois up or down since this can damage the head. Always use a piece of chamois for cleaning.



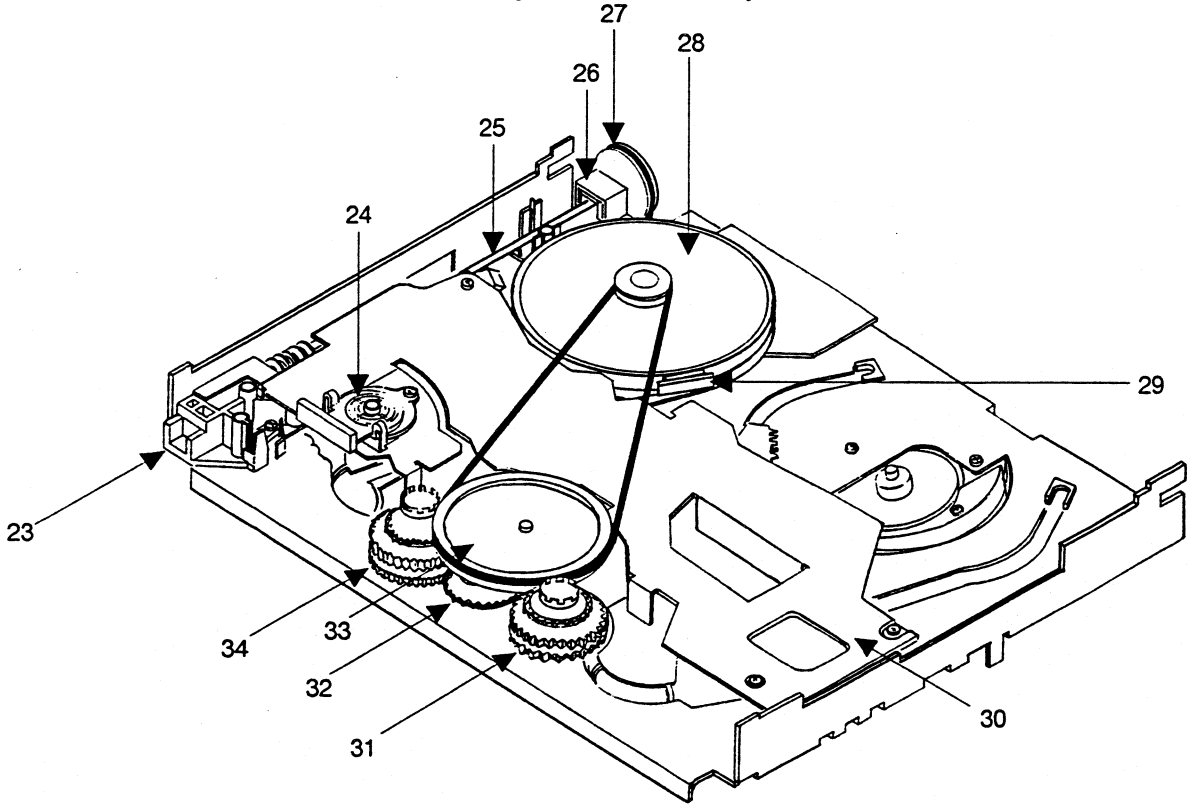
DECK PARTS LOCATIONS

(TOP VIEW)



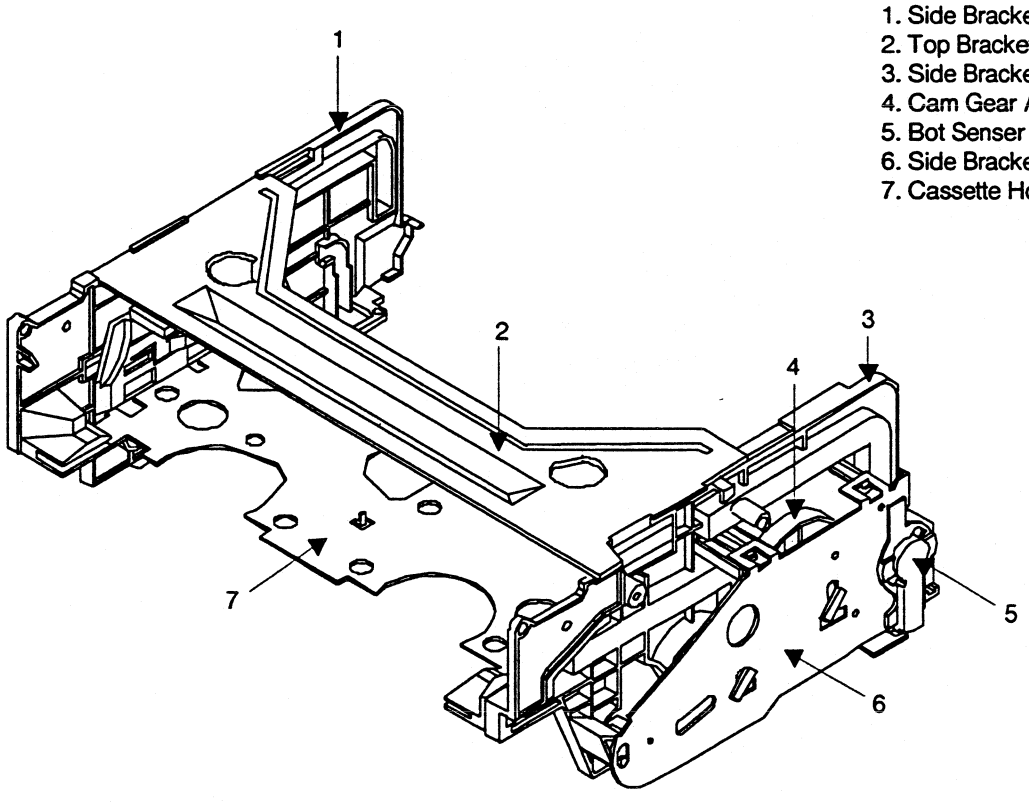
1. Main Chassis
2. Tension Arm Ass'y
3. EOT Reflector
4. Guide Roller S Ass'y
5. P0 Post
6. P1 Post
7. FE Head
8. Cylinder Unit
9. Auto Head Cleaning
10. Head Amp PCB
11. Audio/Control Head
12. Deck Relay PCB
13. Loading Motor
14. Pinch Roller Block
15. Cam Gear
16. Cassette Opener
17. Brake Bracket
18. Reel
19. LED Reflector
20. Guide Roller T Ass'y
21. Reel
22. Tension Band Ass'y

DECK PARTS LOCATIONS
(BOTTOM VIEW)



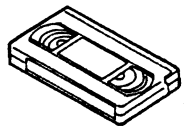
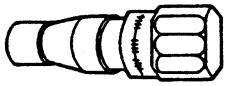
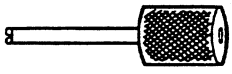
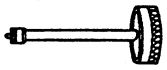
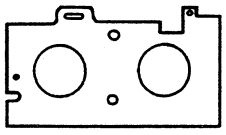
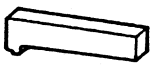
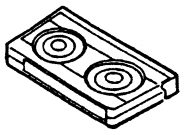
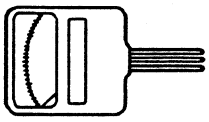
23. Worm Bracket F Ass'y
24. Mode Switch
25. Worm Ass'y
26. Worm Bracket R Ass'y
27. Loading Motor Belt
28. Capstan DD Unit
29. Capstan Brake Ass'y
30. Bottom Plate
31. Clutch Gear S Ass'y
32. Idler Arm Ass'y
33. Center Pulley
34. Clutch Gear T Ass'y

(UNIT ASS'Y)



1. Side Bracket L
2. Top Bracket Ass'y
3. Side Bracket R Ass'y
4. Cam Gear Ass'y
5. Bot Senser Cover
6. Side Bracket R2
7. Cassette Holder Ass'y

SERVICING FIXTURES AND TOOLS

VHS Alignment Tape JG001E (VP1S-LI6[3]) JG001F (VP1S-C01[3]) 	JG002B Adapter JG002F Dial Torque Gauge (60~600gr/cm) JG002G (100~1200gr/cm) 	JG005 Post Adjustment Screwdriver Part No. SV-TG0-030-000 (small) 	JG153 X Value Adjustment Screwdriver 
JG022 Master Plane 	JG024 Reel Disk Height Adjustment Jig 	JG100A Torque Tape (VHT-063) 	JG155 Remote Control
Tentelometer 			

Part No.	Remarks
JG001E	Monoscope, 6KHz
JG001F	Color Bar, 1KHz
JG002F	Playback Take Up Torque
JG002G	Fast Forward Torque, Rewind Torque, Brake Torque (Take up Reel/Supply Reel)
JG005	Guide Roller Adjustment
JG153	X-Value Adjustment
JG022/JG024	Reel Disk Height Adjustment
JG100A	Playback Back Tension Torque
JG155	Used for PG SHIFTER Adjustment

MECHANICAL ADJUSTMENTS

1. CONFIRMATION AND ADJUSTMENT

Read the following NOTED items before starting work.

* Place an object which weighs between 350g and 500g on the Cassette Tape to keep it steady when you want to make the tape run without the Unit Ass'y. (Do not place an object which weighs over 500g.)
* When you activate the deck without the Unit Ass'y, short circuit between **TP1010** and **TP1011**. In this condition the BOT/EOT sensor will not function.

1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

1. Turn on the power and set to the STOP mode.
2. Set the master plane **(JG022)** and reel disk height adjustment jig **(JG024)** on mechanism framework, taking care not to scratch the drum, as shown in **Fig. 1-1-A.**
3. Confirm that the reel disk is lower than "A" of the reel disk height adjustment jig **(JG024)** on the master plane and higher than "B" as shown in **Fig. 1-1-B.** If it is not, adjust to less than 7.5mm±0.2mm with the height adjustment washer.
4. Perform the same adjustment for other reel.

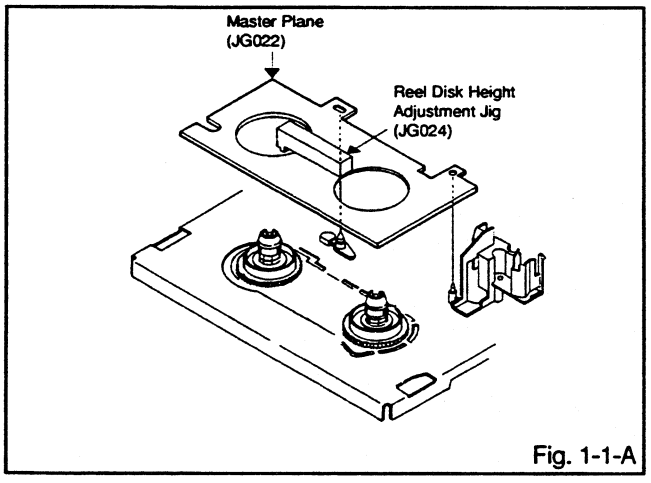


Fig. 1-1-A

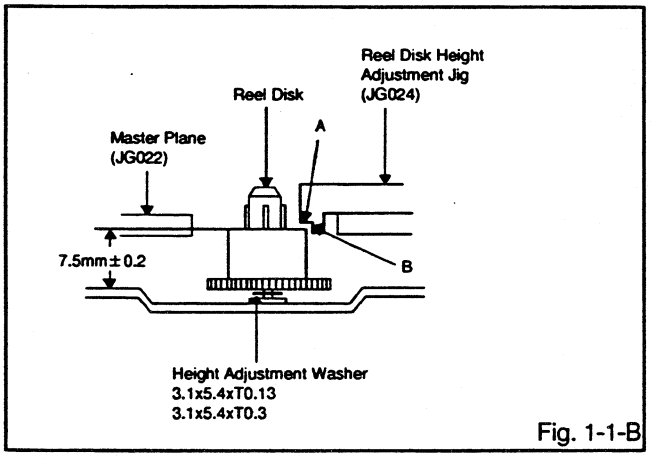


Fig. 1-1-B

1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

1. Turn on the power and set to the PLAY mode adjust the Tension Adjust so that the Tension Post is at the position of 0.3mm~0.5mm from the Rib. **(Refer to Fig. 1-2)**
2. Confirm that the video tape is not curling at the flange of P1 post or is not running on flanges.

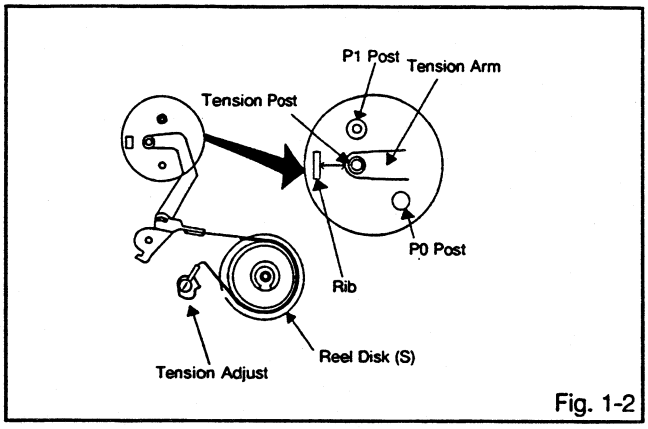


Fig. 1-2

1-3: CONFIRMATION AND ADJUSTMENT OF BACK TENSION ON PLAYBACK

1. Load a video tape recorded in standard speed mode. Set the unit to the PLAY mode.
2. Install the tentelometer as shown in **Fig. 1-3.** Confirm the value is within 20~27gr/cm at this time.

※ IN CASE OF USING A CASSETTE TYPE TORQUE TAPE.

1. After adjustment, confirm and adjust the tension post position **(Refer to item 1-2)** for the tension arm, install the cassette type torque tape **(JG100A)** and set to the PLAY mode.
2. Confirm that the left hand side tension value of the torque tape is 25~38gr/cm for the standard mode tape.

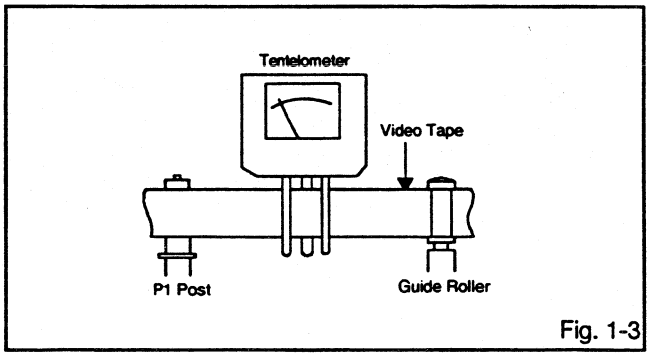


Fig. 1-3

MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF FAST FORWARD TORQUE

1. Set torque gauge **(JG002G)** on take-up reel disk, and place unit in FAST FORWARD mode. **(Refer to Fig. 1-4)**
2. Confirm that torque is more than 400gr/cm.

NOTE

After setting the torque gauge on the reel disk, hold the gauge in place.
Push the FAST FORWARD button and the reel disk will begin to turn.

1-5: CONFIRMATION OF REWIND TORQUE

1. Operate within 4 or 5 seconds after the reel disk begins to turn.
2. Set torque gauge **(JG002G)** on supply reel disk, and place the unit in REWIND mode. **(Refer to Fig 1-4)**.
3. Confirm that torque is more than 400gr/cm.

NOTE

After setting the torque gauge on the reel disk, hold the gauge in place.
Push the REWIND button and the reel disk will begin to turn.

1-6: CONFIRMATION OF REEL BRAKE TORQUE

(Take-Up Reel Brake) **(Refer to Fig. 1-4)**

1. Set to STOP mode.
2. Set the torque gauge **(JG002G)** to the take-up reel and turn it counterclockwise.
3. Confirm that it is more than 200gr/cm at that time.

(Supply Reel Brake) **(Refer to Fig. 1-4)**

1. Set to STOP mode.
2. Set the torque gauge **(JG002G)** to the supply reel and turn it clockwise.
3. Confirm that it is more than 200gr/cm at that time.

NOTE

Separate the idler from the reel and confirm the brake torque.

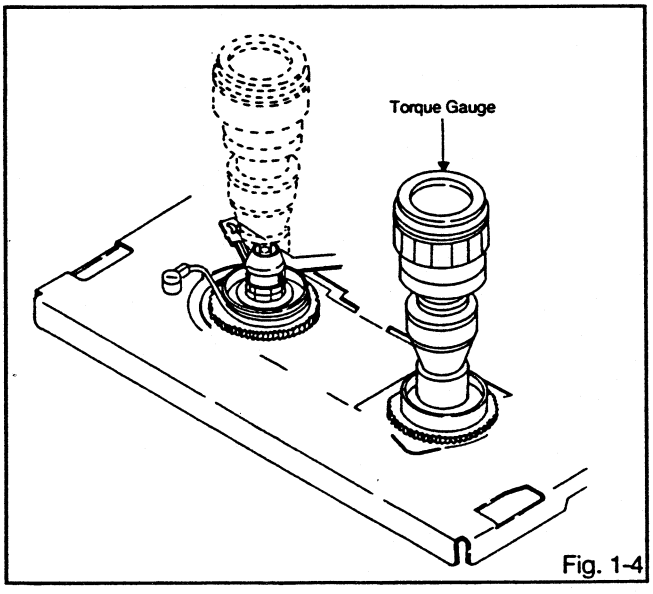


Fig. 1-4

NOTE

If the torque value checked is out of tolerance, replace the appropriate parts as follows.

Check Items	Replace Parts
1-4	Idler Ass'y or Clutch ASS'Y
1-5	Idler Ass'y or Clutch ASS'Y
1-6	Main Brake T Ass'y or Main Brake S Ass'y

2. TAPE RUNNING CONFIRMATION AND ADJUSTMENT

Tape running is adjusted precisely at the factory. Normally, it is not necessary to make adjustments. It is necessary to confirm and make adjustments when the parts of the tape running mechanism are replaced because of extensive usage or failure.

2-1: GUIDE ROLLER

1. Connect CH-1 on the oscilloscope to **TP4002 (PB Envelope)** and CH-2 to **TP4001 (SW Pulse)**.
2. Set the tracking to manual center position in the following way. Hold and press the tracking auto button more than 2 seconds to set the tracking to center position.
3. Trigger with SW pulse and observe the envelope. **(Refer to Fig. 2-1-A)**
4. Adjust the guide roller height while observing the envelope, and make the envelope flat. Adjust the envelope so that the flatness will not be affected even when the tracking control button is pressed. (Use the adjustment screwdriver **JG005)**.
5. Press and hold the tracking control button and (at the point that the envelope waveform starts to reduce) adjust the envelope so that the A : B ratio is better than 3 : 2. **(Refer to Fig. 2-1-B)**
6. Adjust the PG shifter **(ELECTRICAL ADJUSTMENTS : ITEM 3-1)** in the PLAY mode.

NOTE

After adjustment, confirm and adjust A/C head tilt. **(Refer to item 2-2)**

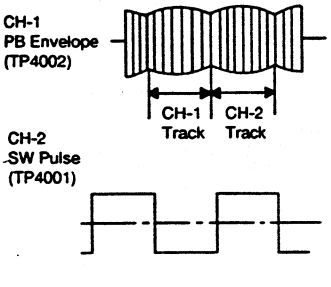


Fig. 2-1-A

MECHANICAL ADJUSTMENTS

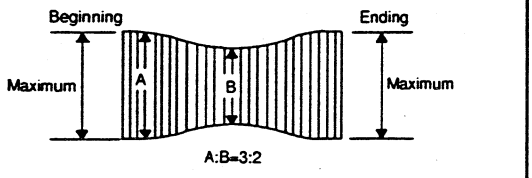


Fig. 2-1-B

2-2: CONFIRMATION AND ADJUSTMENT OF A/C HEAD TILT

When the tape is running abnormally, perform the following adjustments.

1. Insert a new tape and play it back.
2. Confirm that there is no crease on the tape between the P4 post and guide roller (R) and the tape is running smoothly. (It is absolutely impossible to get satisfactory sound if the tape is distorted between the A/C head and P4 post.)
3. If the tape still does not run smoothly, turn the screw ① and adjust the tilt of the A/C head. **(Refer to Fig. 2-2)**

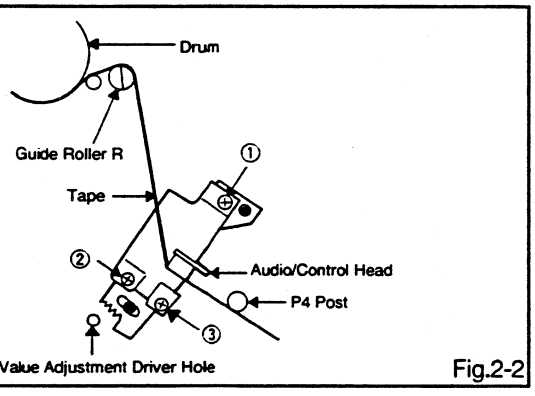


Fig.2-2

2-3: ADJUSTMENT OF A/C HEAD HEIGHT AND AZIMUTH

1. Playback a VHS alignment tape **(JG001E)** and observe the waveform at the audio output terminal.
2. Turn the screw ② slowly to change the azimuth of the A/C head. Adjust the height so that the audio output becomes maximum. **(Refer to Fig. 2-2)**
3. Adjust the screw ③, **(Refer to Fig. 2-2)** until the height of the A/C head reaches the position against the tape as shown in **Fig. 2-3.**
4. When the control head height is not fit. (When you must turn the screw more than 45 degrees), Turn all of the screws ①, ② and ③ to the same degrees. Then confirm the angle of the audio/control head and adjust again.

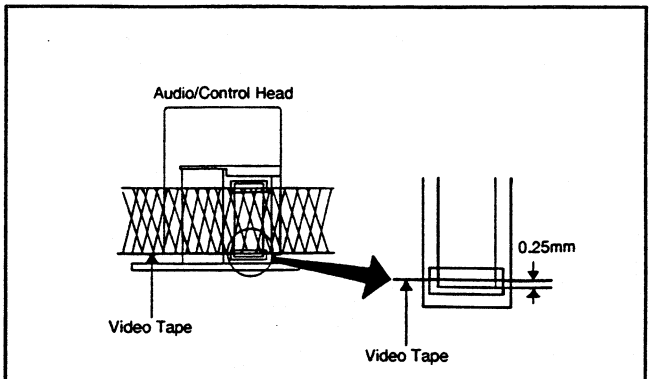


Fig. 2-3

2-4: TAPE RUNNING ADJUSTMENT

1. Adjust the height of reel disk. **(Refer to item 1-1)**
2. Confirm and adjust tension post position. **(Refer to item 1-2)**
3. Adjust the guide roller. **(Refer to item 2-1)**
4. Adjust the A/C head tilt. **(Refer to item 2-2)**
5. Adjust the A/C head height and azimuth. **(Refer to item 2-3)**
6. Connect CH-1 on the oscilloscope to **TP4001** and CH-2 to **TP4002.** Playback the VHS alignment tape **(JG001E).** Set the tracking to manual center. Adjust X with the screw driver for X **(JG153)** as the **Fig. 2-1-A** and **Fig. 2-1-B. (Refer to No. 2 of the item 2-1).**

ELECTRICAL ADJUSTMENTS

3. ADJUSTMENT PROCEDURE

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

When replacing IC's or transistors, use only specified silicon grease **(YG6260M).**
(To prevent the damage to IC's and transistors.)

3-1: PG SHIFTER

CONDITIONS

MODE-PLAYBACK
Input Signal-Alignment Tape **(JG001E)**

INSTRUCTIONS

1. Playback the alignment tape. **(JG001E)**
2. Press both Tracking AUTO key on the Customer remote control and the PLAY button on the set simultaneously until the indicator ATR disappear's. If the indicator ATR disappear's, the adjustment is finished.

(If the ATR indicator is still illuminated)

1. Connect CH-1 on the oscilloscope to **TP4001** and CH-2 to **Pin 19 of J4501.**
2. Press the PG AUTO key. **(JG155)**
3. While the ATR indicator is flashing, press the PG MANUAL key. **(JG155)**
4. Adjust the Tracking +/– key until waveform of the oscilloscope measures 6.5 ± 0.5(H) at both leading and trailing edges. **(Refer to Fig. 3-1-A, B)**
5. Press the Tracking Auto key.

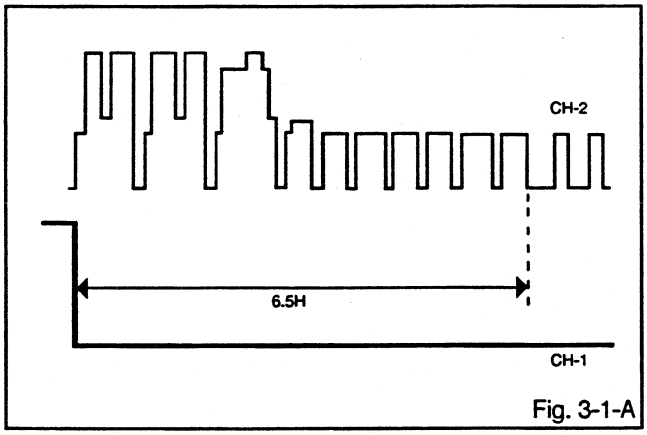


Fig. 3-1-A

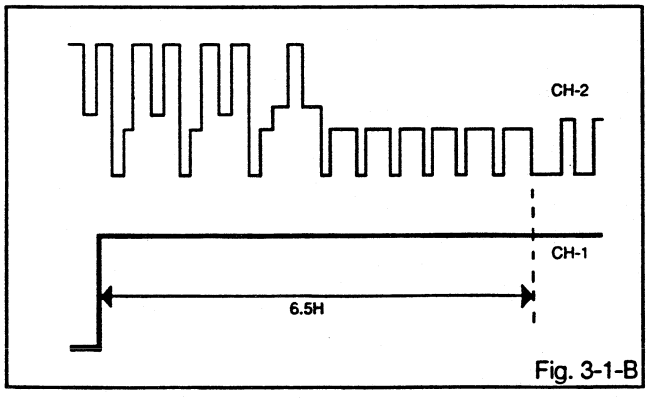
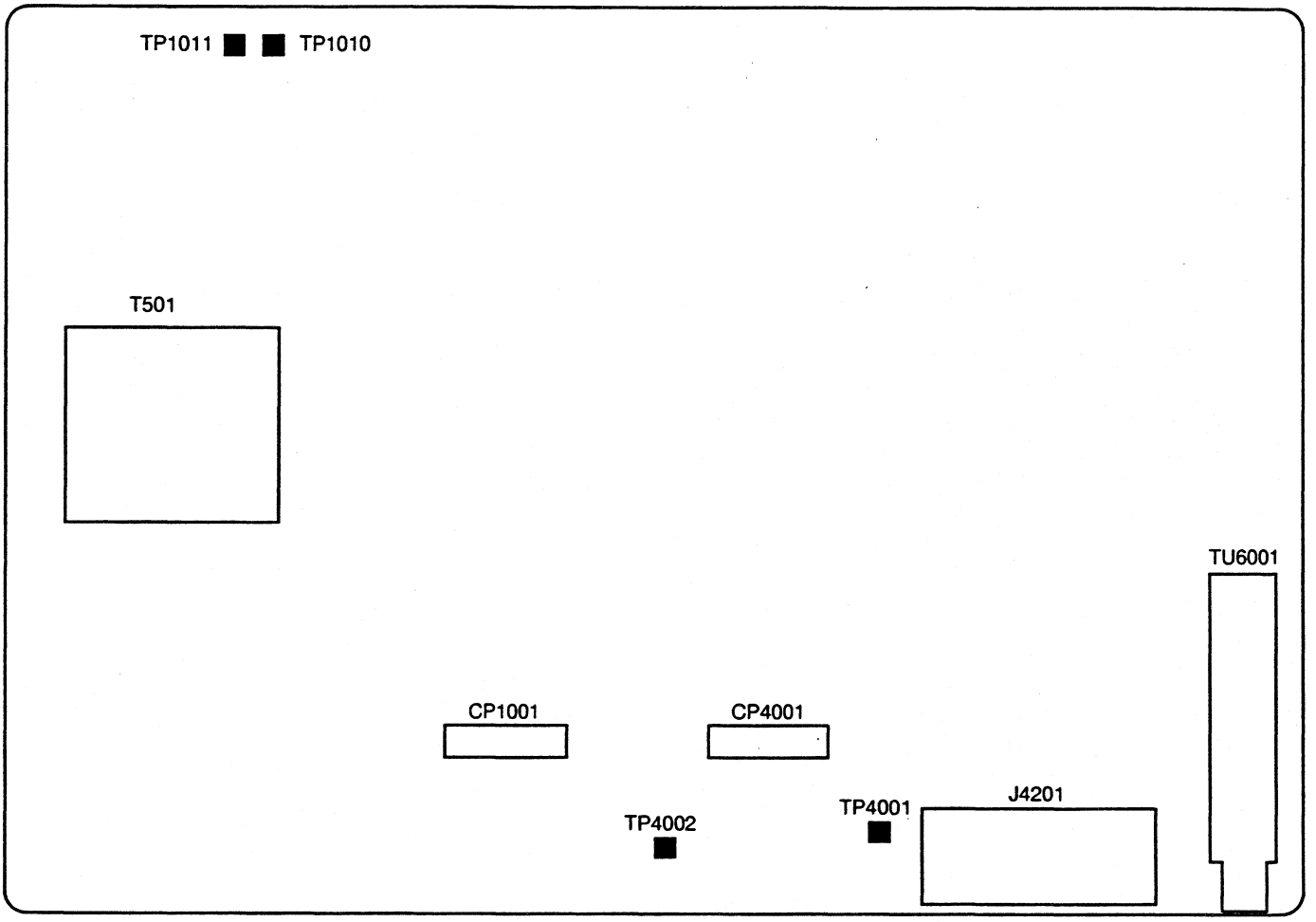


Fig. 3-1-B

MAJOR COMPONENTS LOCATION GUIDE

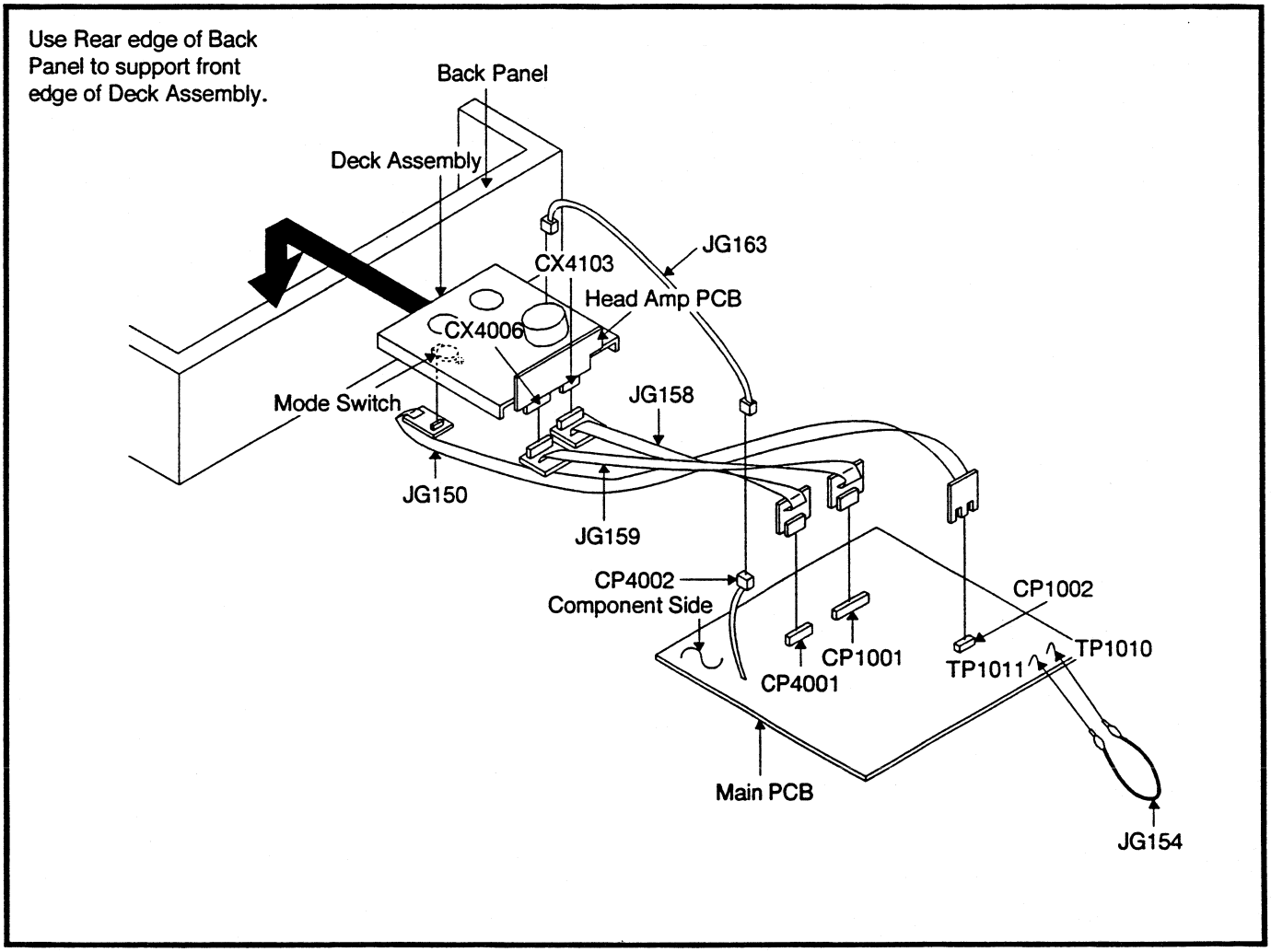


MAIN

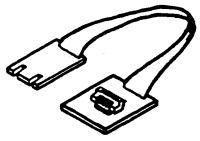
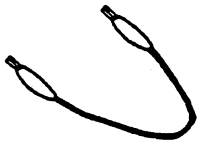
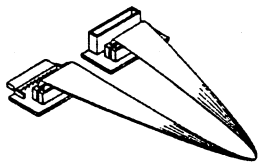
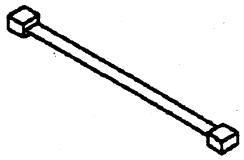
PREPARATION FOR SERVICING

How to use the Servicing Fixture

1. Remove the Main PCB from the Deck Chassis.
2. Connect as shown in the below figure using the Service Fixture.
   - ○ Connect the Main PCB to the Mode Switch with the cable JG150.
   - ○ Connect the Main PCB to the Head Amp PCB with the cable JG158 and JG159.
   - ○ Connect the Main PCB to the FE Head with the cable JG163.
3. Short circuit between **TP1010** and **TP1011** with the cable JG154.
   (Refer to MAJOR COMPONENT LOCATION GUIDE)
4. The EOT, BOT and Reel Sensor do not work at this moment.
5. At that time, the STOP/EJECT button is available to insert and eject the Cassette Tape.

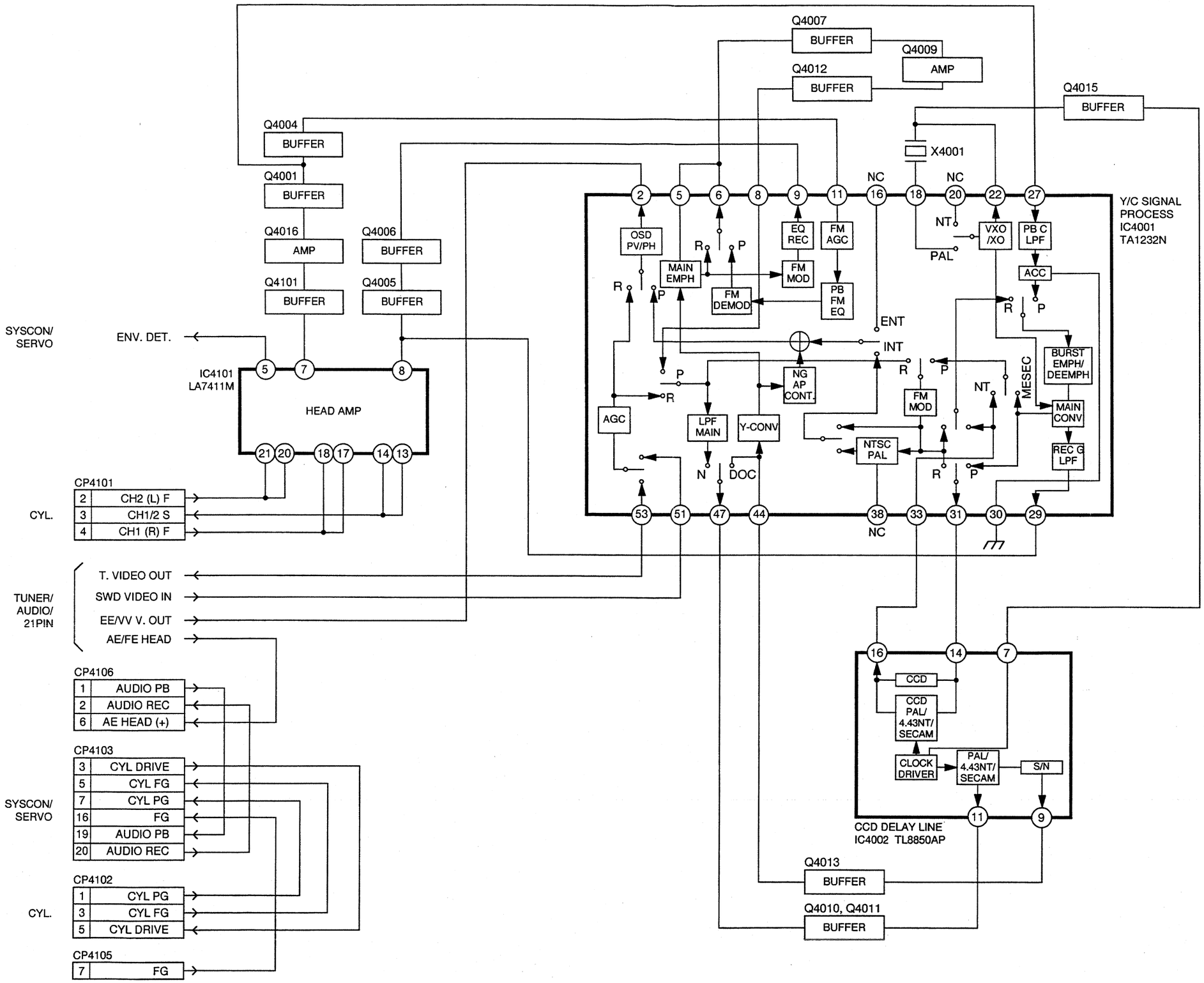


SERVICING FIXTURES AND TOOLS

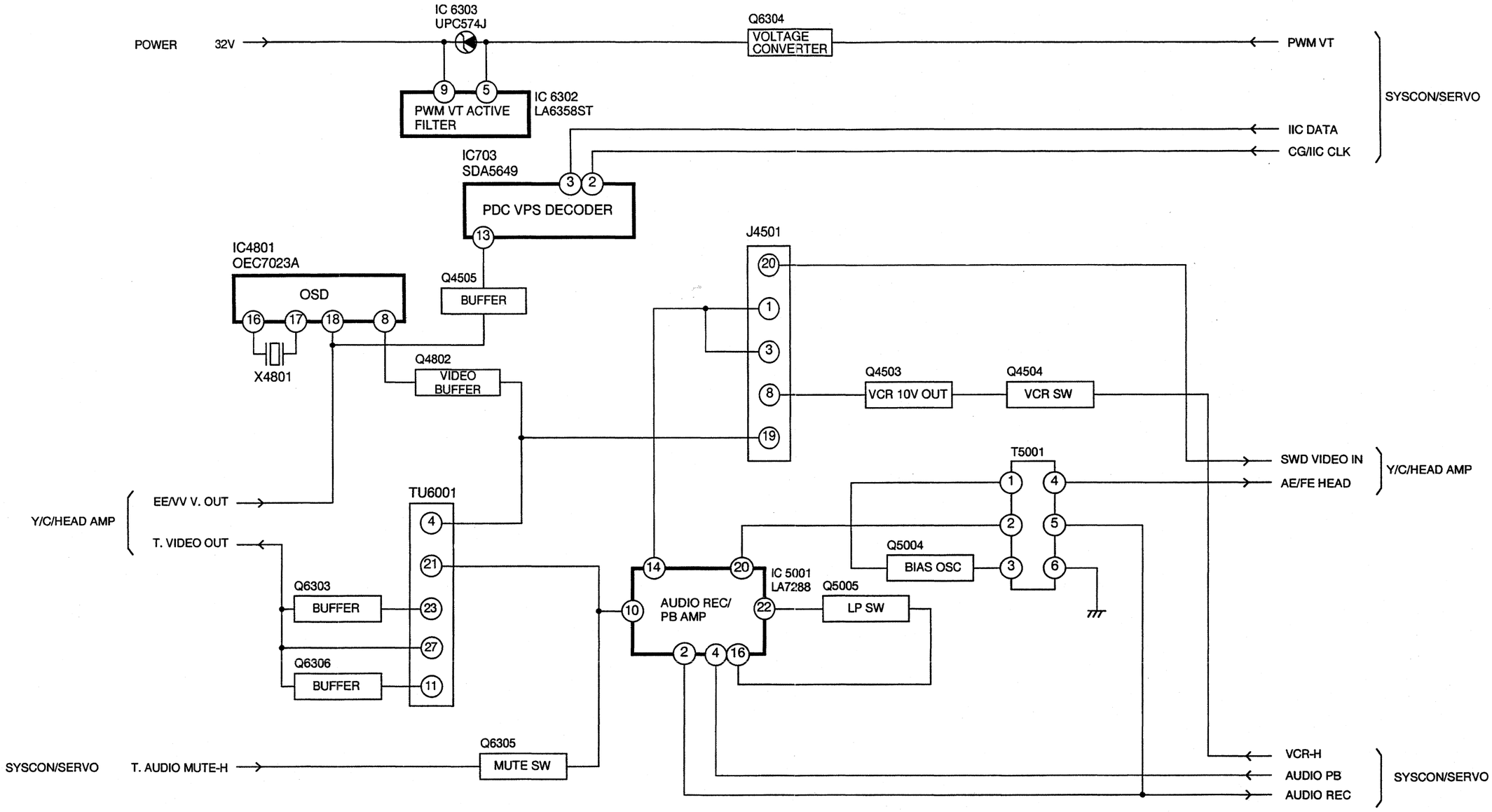
JG150 Cable	JG154 Cable	JG158 Cable (16 Pin) JG159 Cable (20 Pin)	JG163 Cable
			

Part No.	Remarks
JG150	Used to connect the MAIN PCB and MODE SWITCH
JG154	Used to connect the test point of SERVICE and GROUND
JG158/JG159	Used to connect the MAIN PCB and HEAD AMP PCB
JG163	Used to connect the MAIN PCB and FE HEAD

Y/C／HEAD AMP BLOCK DIAGRAM

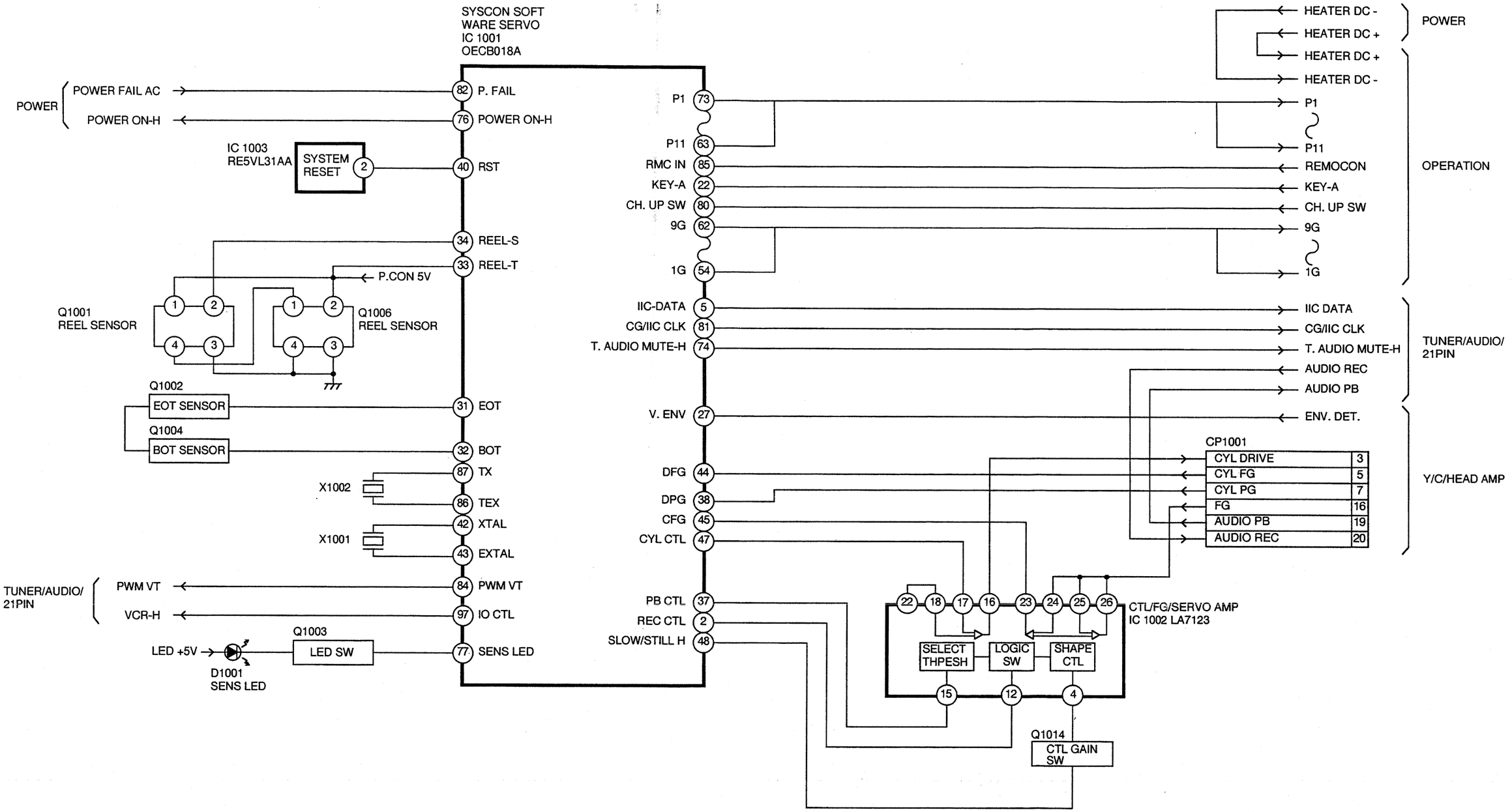


TUNER／AUDIO／21PIN BLOCK DIAGRAM



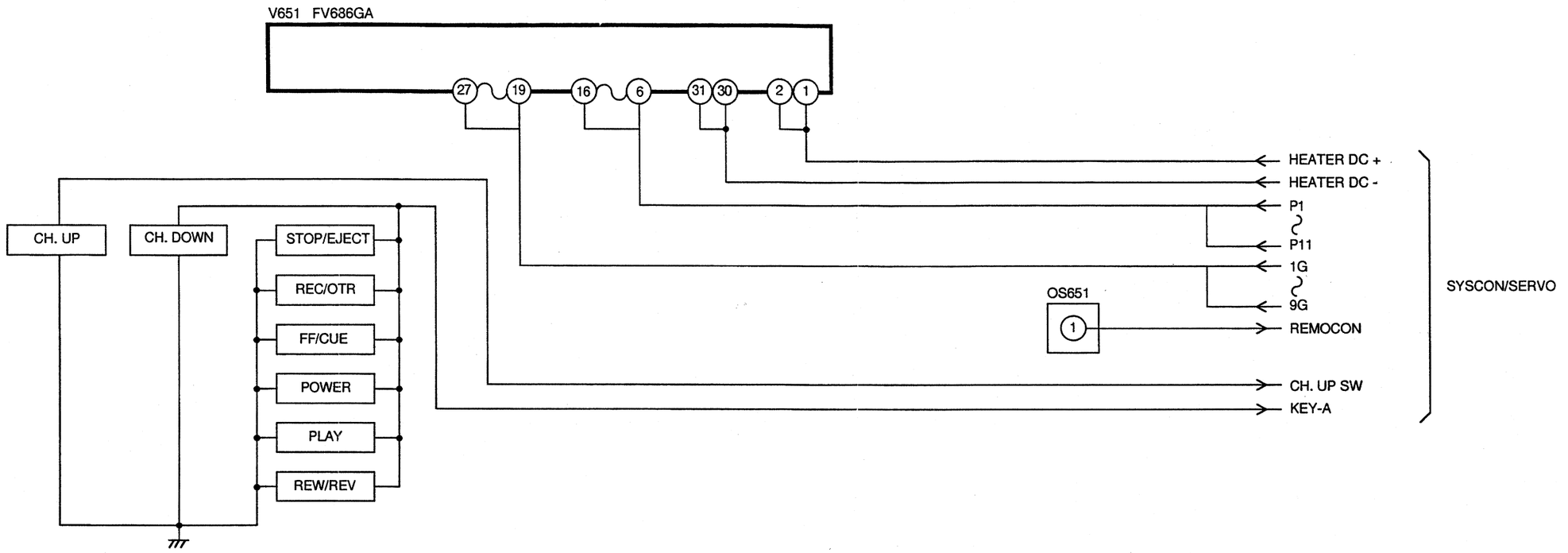
3-5346

SYSTEM CONTROL／SERVO BLOCK DIAGRAM

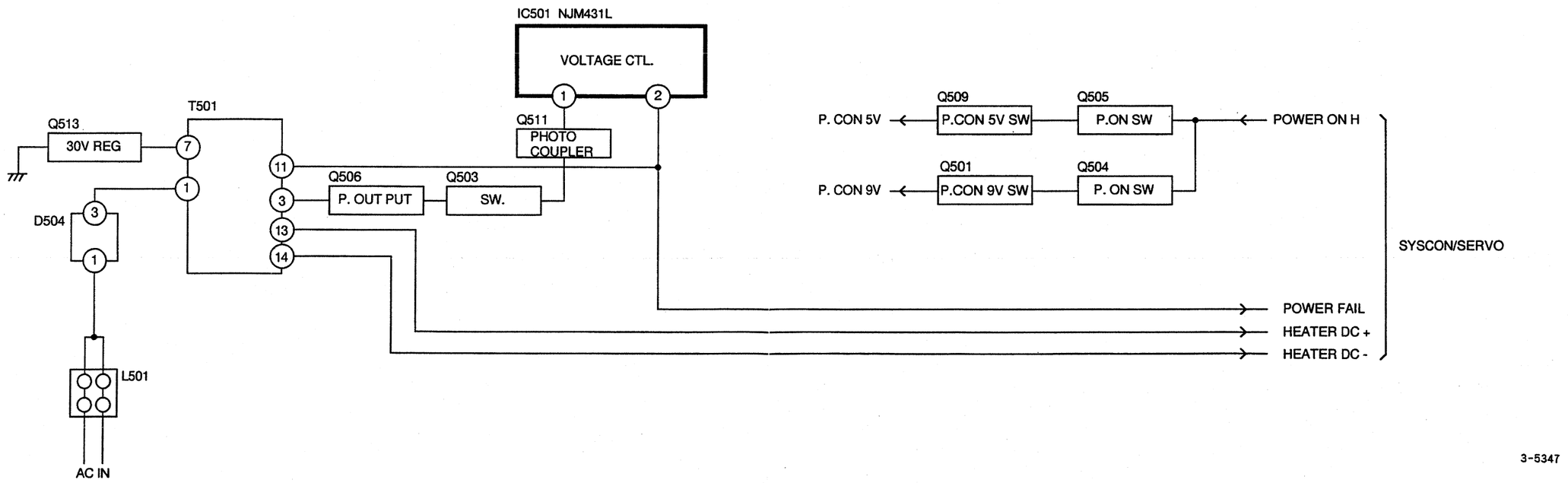


3-5345

OPERATION BLOCK DIAGRAM



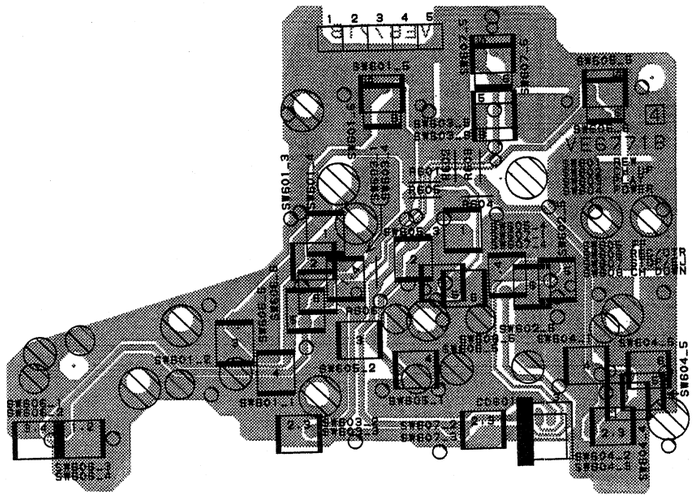
POWER BLOCK DIAGRAM



3-5347

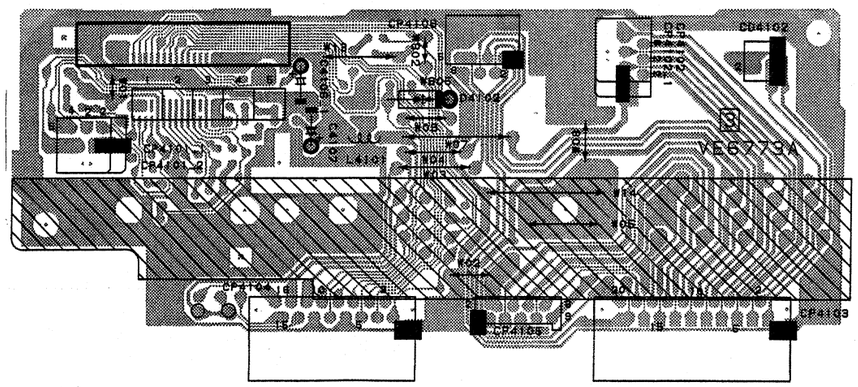
PRINTED CIRCUIT BOARDS

OPERATION

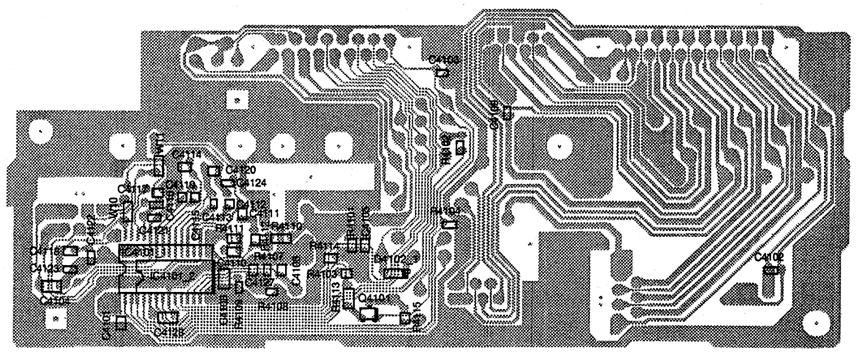


HEAD AMP

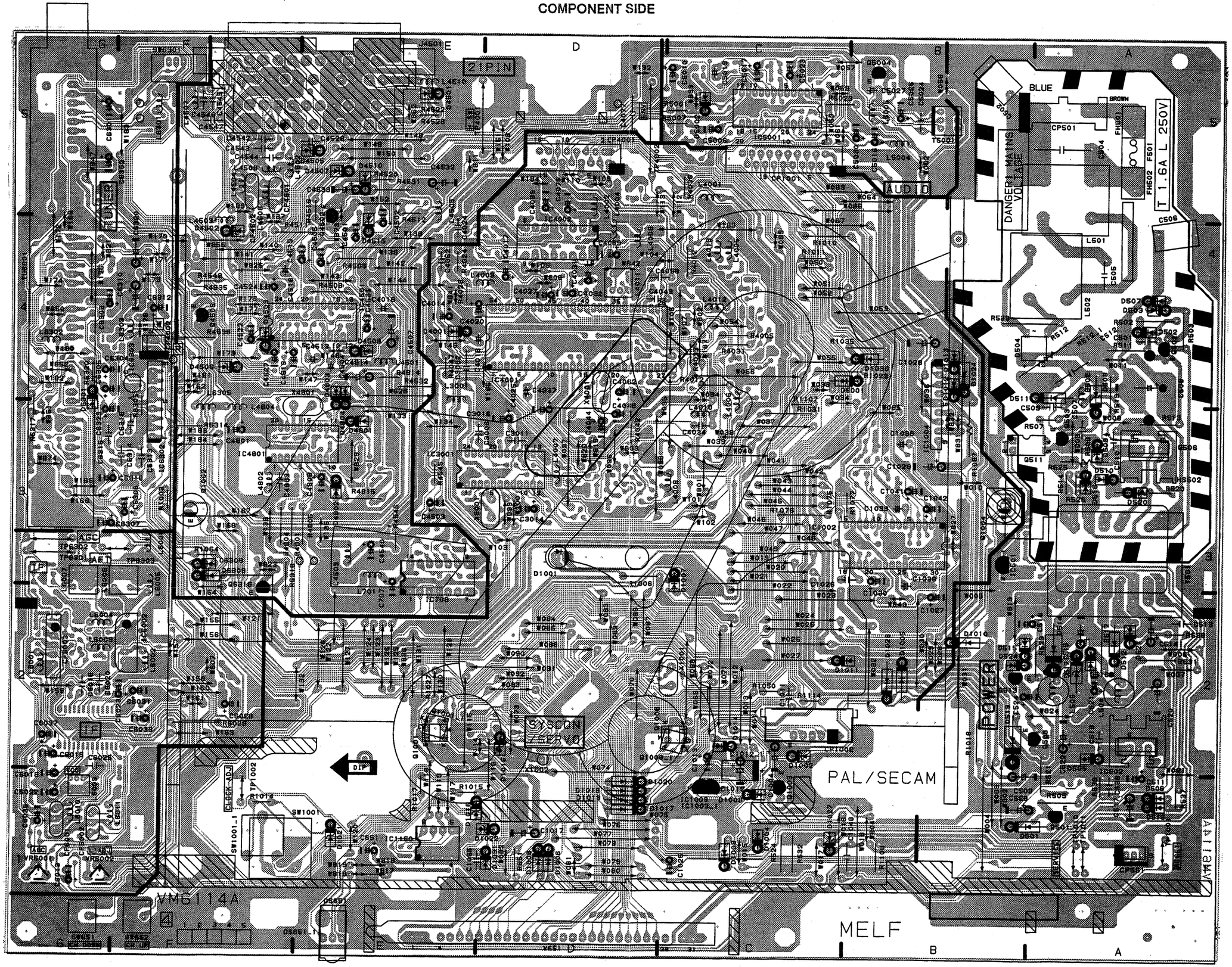
COMPONENT SIDE



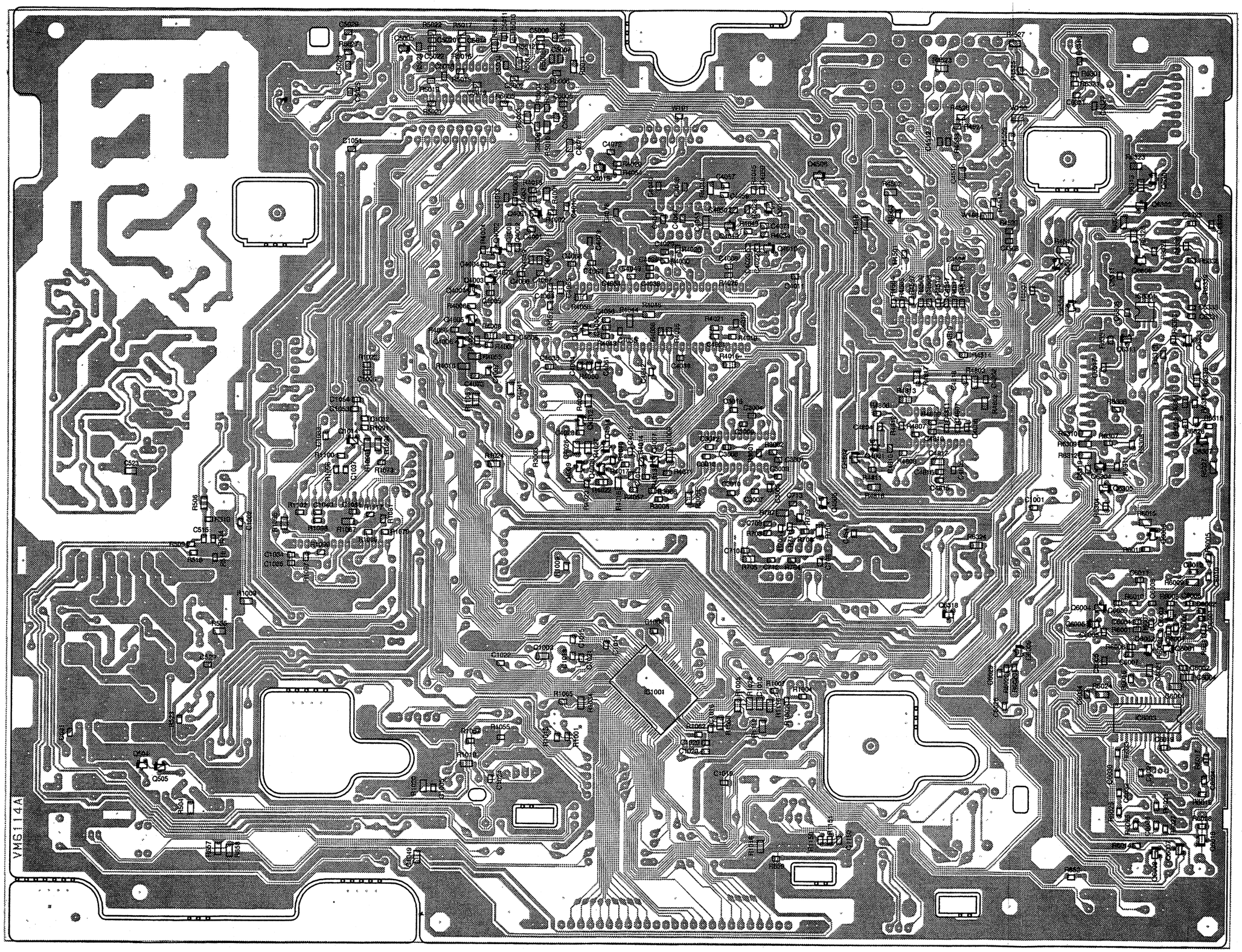
SOLDER SIDE



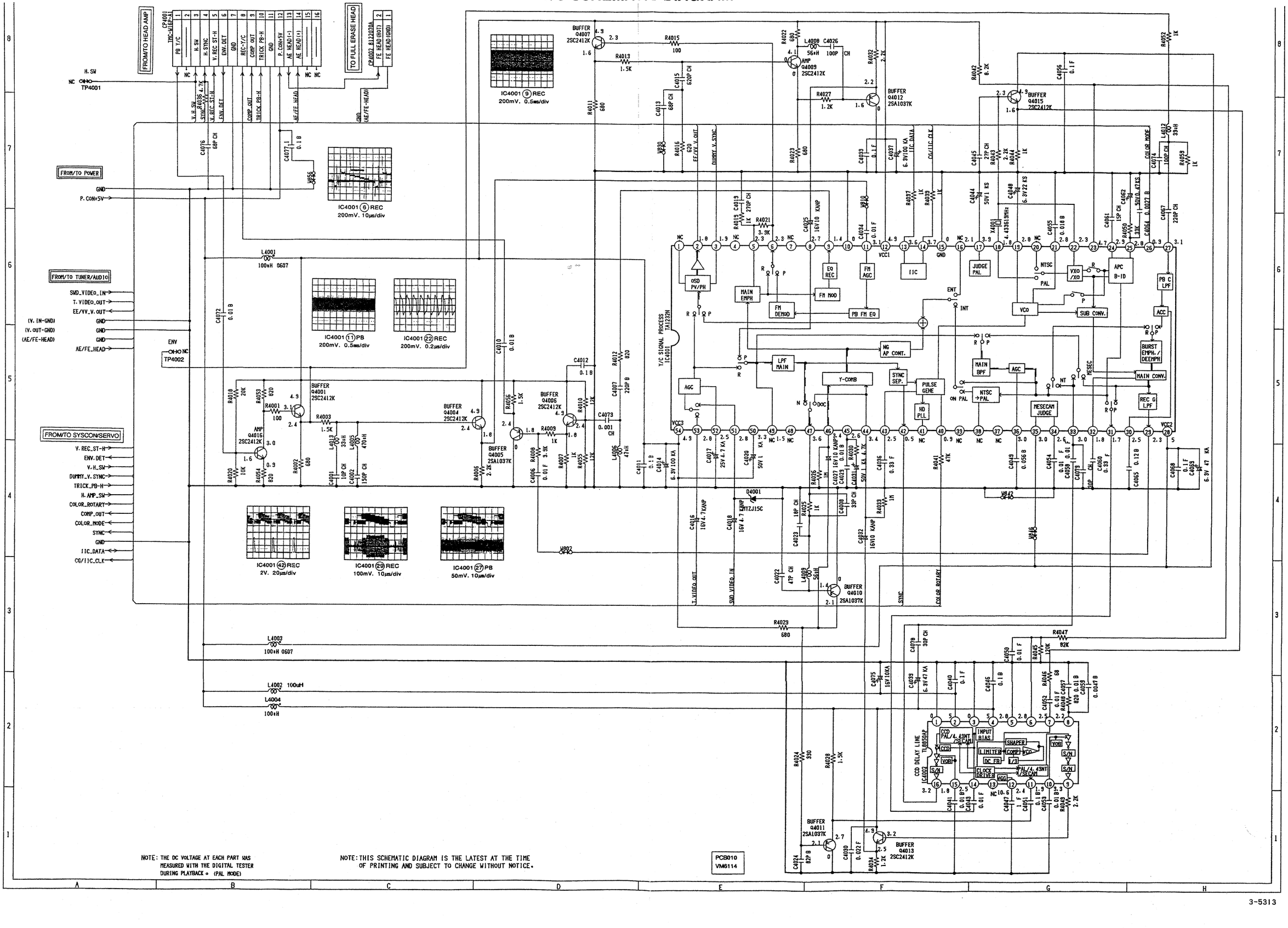
PRINTED CIRCUIT BOARDS
MAIN
COMPONENT SIDE



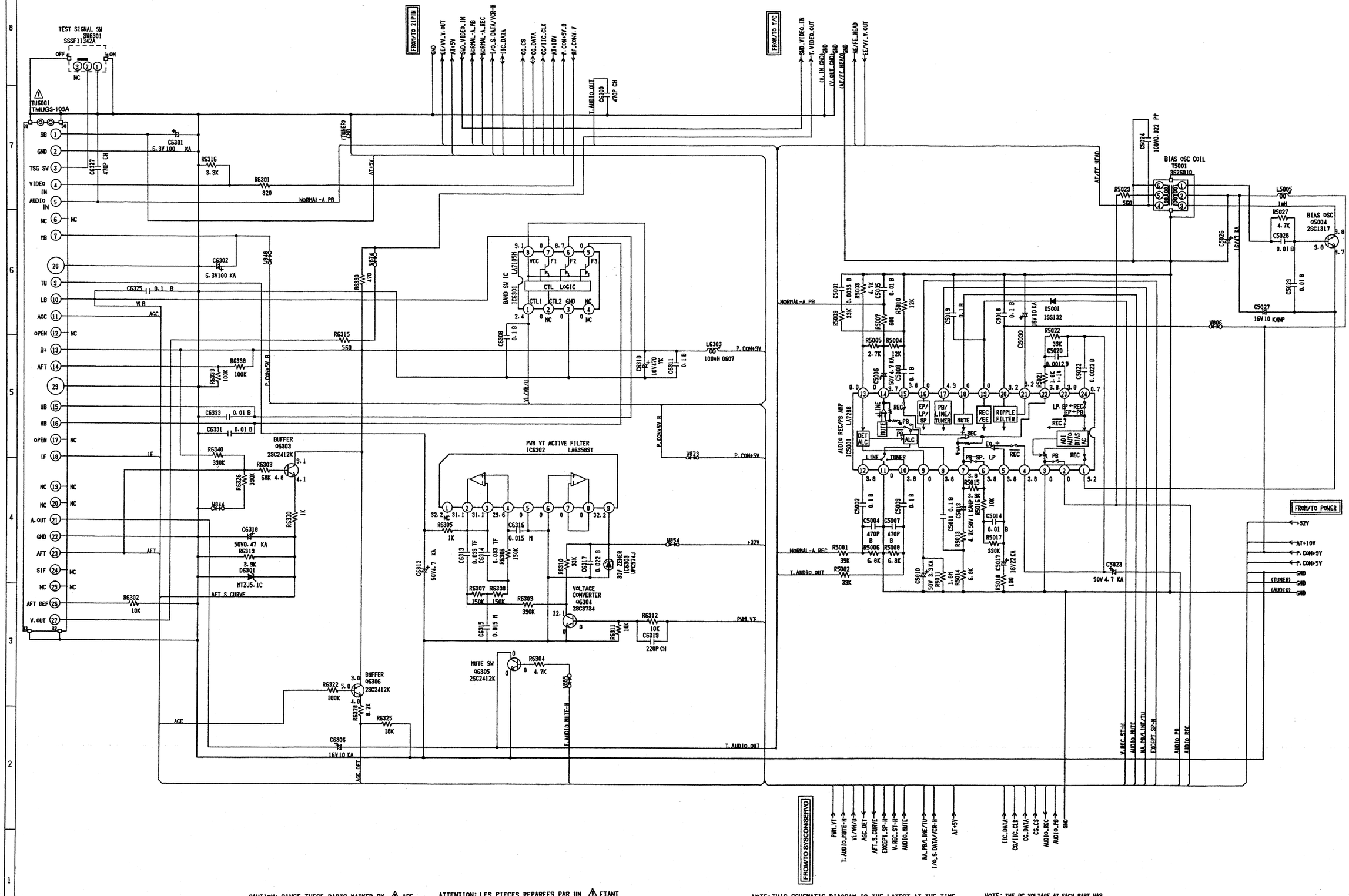
PRINTED CIRCUIT BOARDS
MAIN
SOLDER SIDE



Y/C SCHEMATIC DIAGRAM



TUNER／AUDIO SCHEMATIC DIAGRAM



CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY. USE ONES DESCRIBED IN PARTS LIST ONLY.

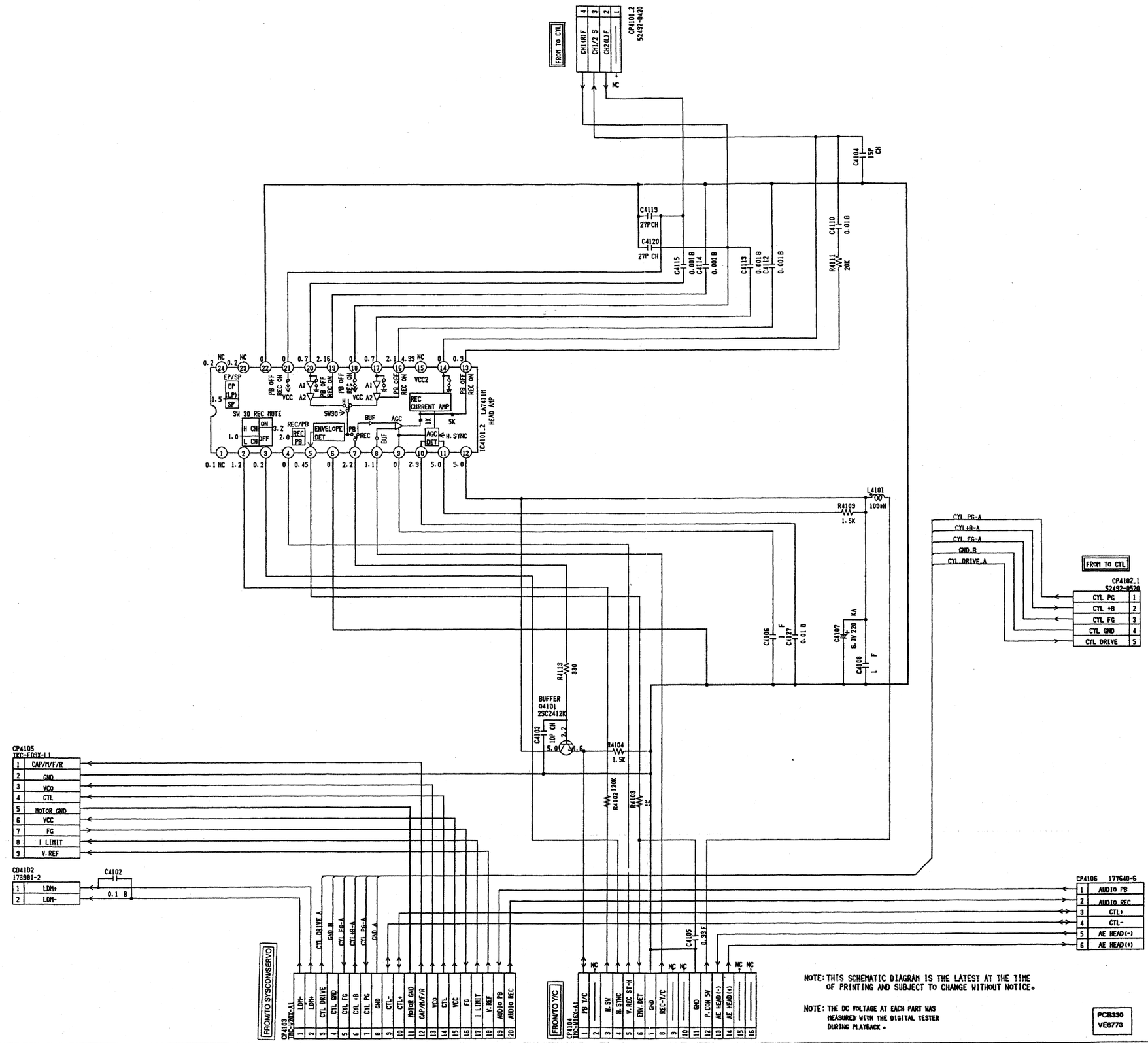
ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

PCB010
VM6114

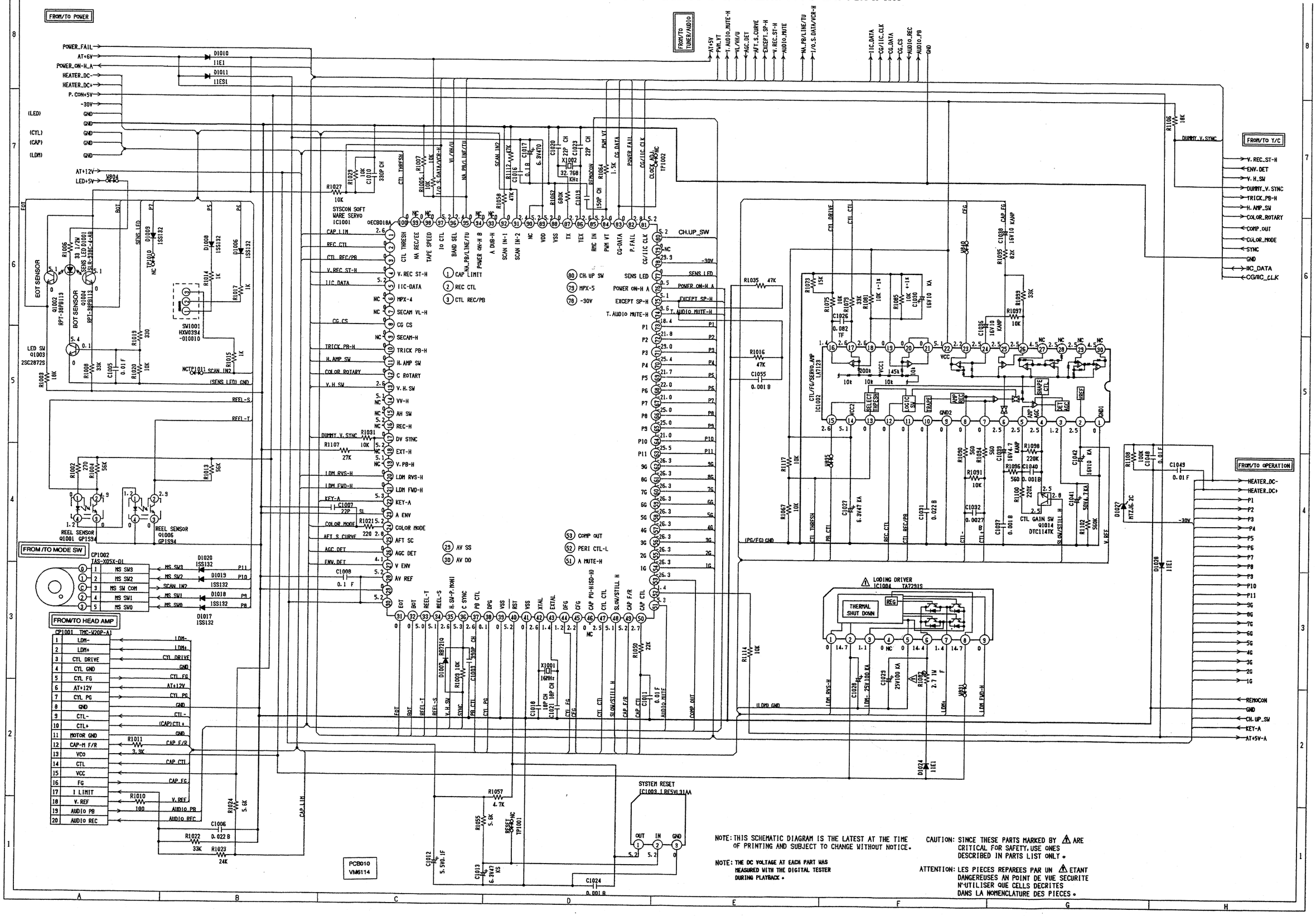
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

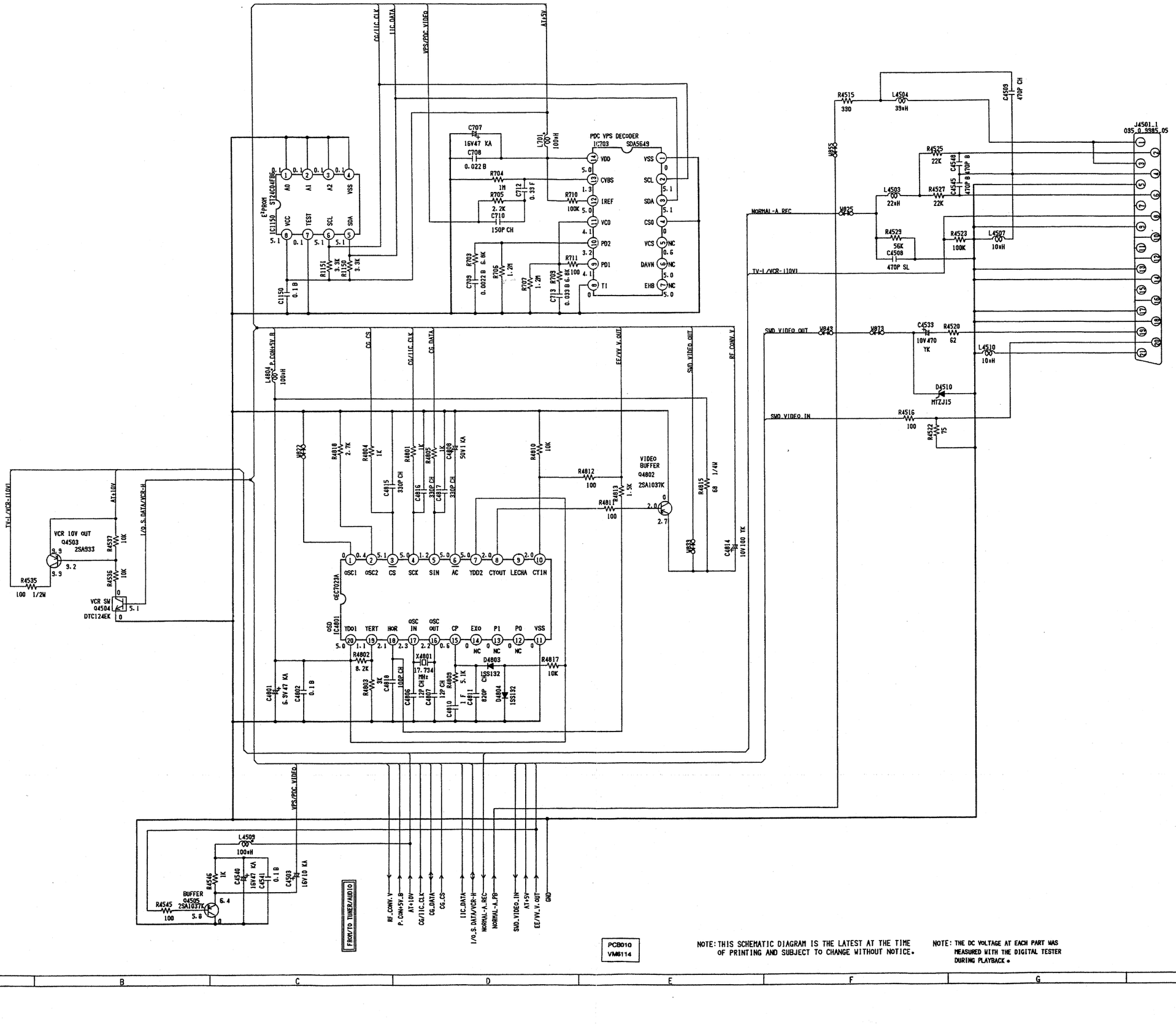
HEAD AMP SCHEMATIC DIAGRAM



SYSTEM CONTROL／SERVO SCHEMATIC DIAGRAM


FROM/TO POWER
FROM/TO TUNER/AUDIO
FROM/TO Y/C
FROM/TO OPERATION
FROM/TO MODE SW
FROM/TO HEAD AMP
SYSCON SOFT WARE SERVO IC1001
CTL/FG/SERVO AMP IC1002 LA7729
LOADING DRIVER IC1004 TA7291S
SYSTEM RESET IC1003 IRESV131M
EOT SENSOR Q1002 RPT-38PB113
BOT SENSOR Q1004 RPT-38PB113
LED SW Q1003 2SC2872S
REEL SENSOR Q1001 GP1S94
REEL SENSOR Q1006 GP1S94
CP1002 TAS-X05X-D1
CP1001 THC-W20P-A1
SW1001 HXW0394 -010010
CH.UP_SW
REMOCON
KEY-A
AT+5V-A
HEATER_DC-
HEATER_DC+
THERMAL SHUT DOWN
REG
PCB010 VM6114
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.
ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

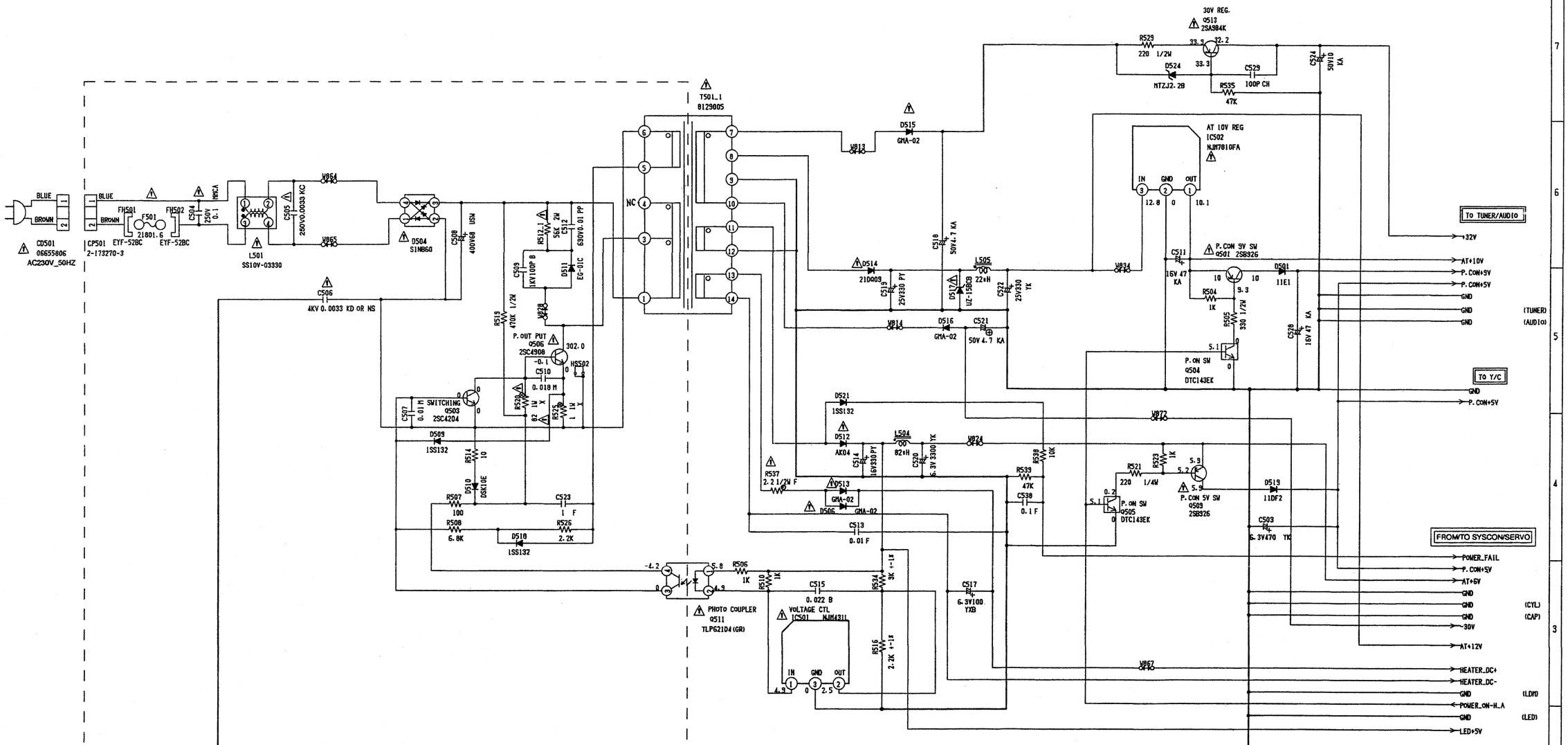
21PIN SCHEMATIC DIAGRAM



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

POWER SCHEMATIC DIAGRAM



CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY. USE ONES DESCRIBED IN PARTS LIST ONLY.

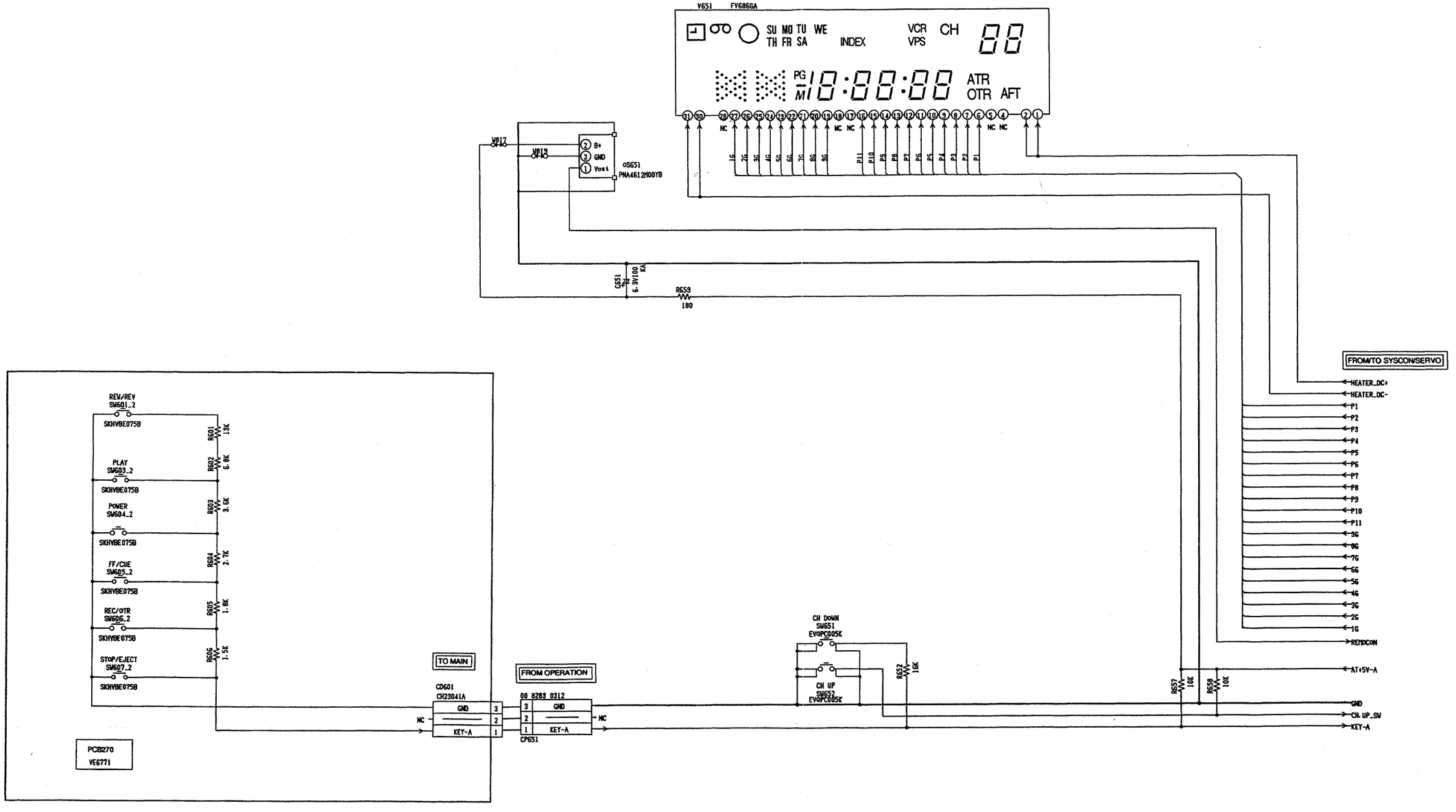
ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

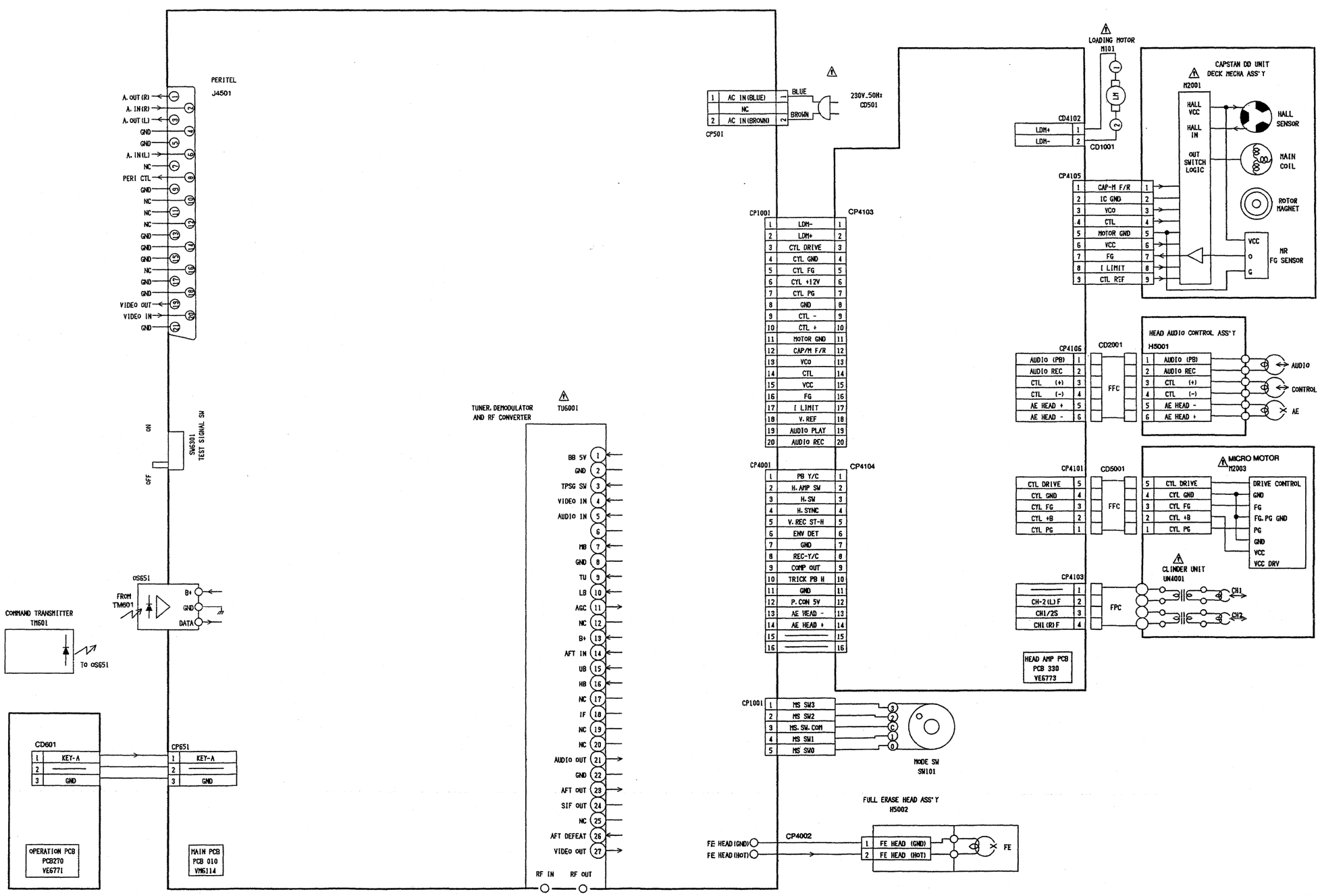
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

PCB010
VM6114

OPERATION SCHEMATIC DIAGRAM



INTERCONNECTION DIAGRAM

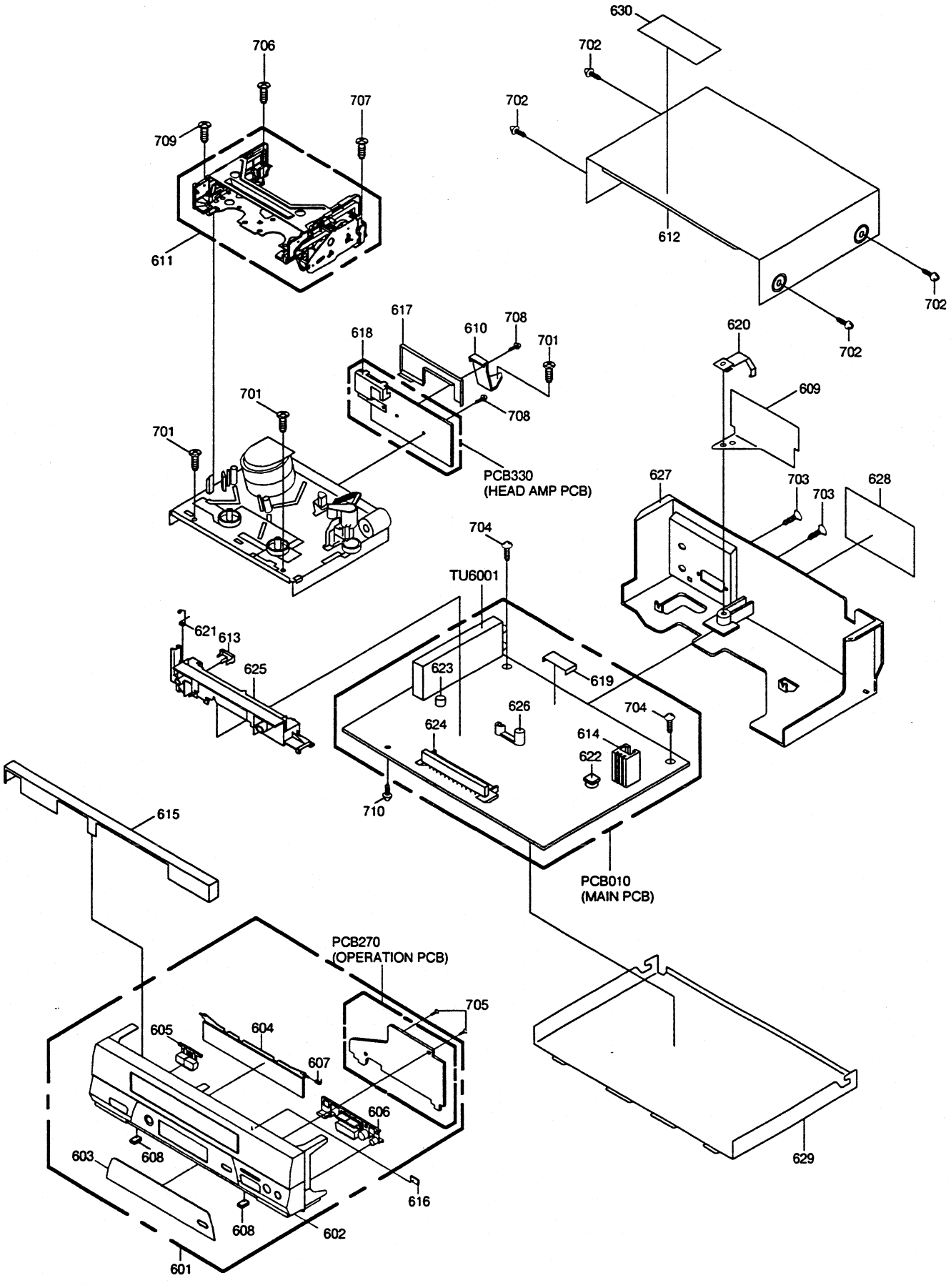


CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY. USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

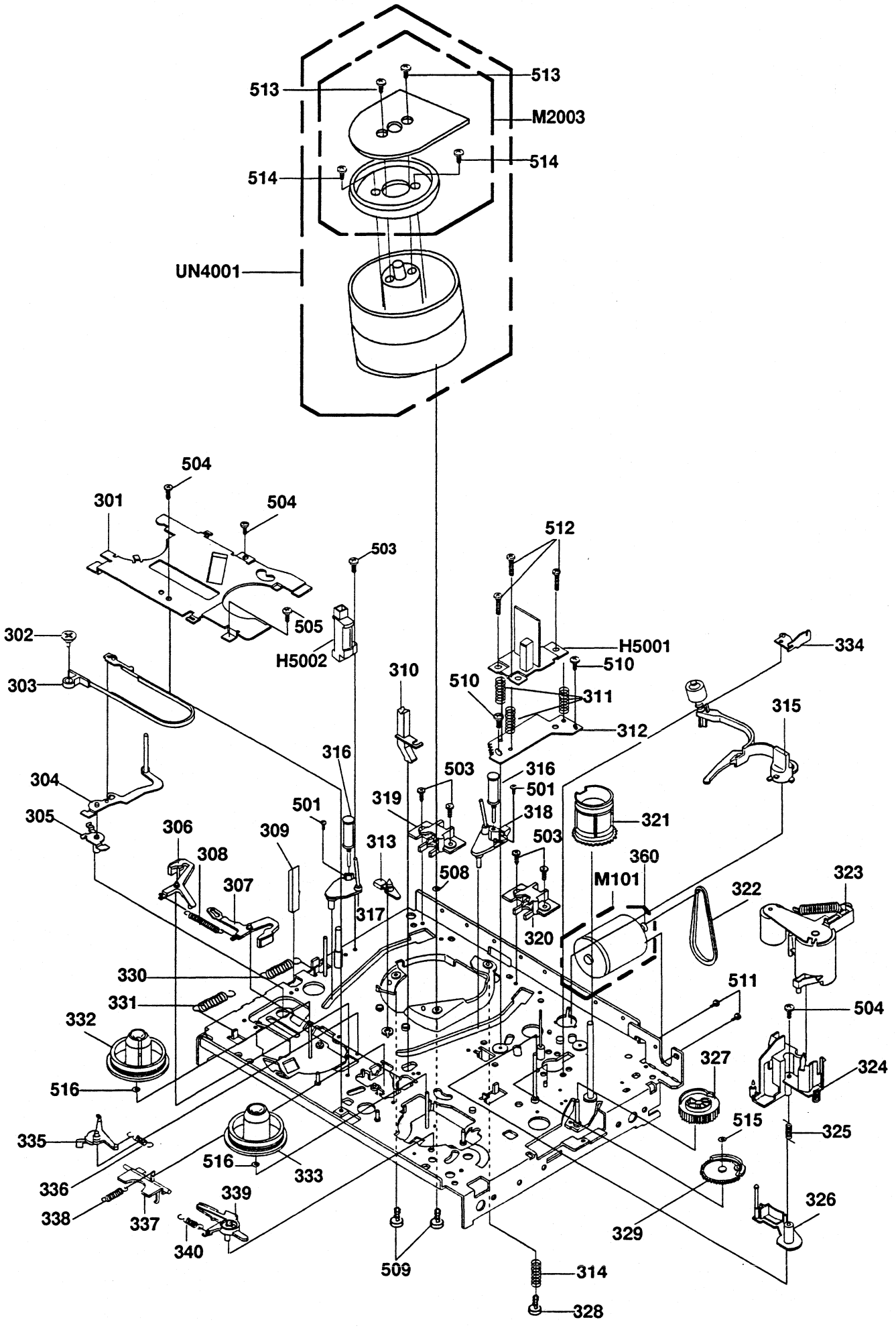
NOTE: THIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

MECHANICAL EXPLODED VIEW



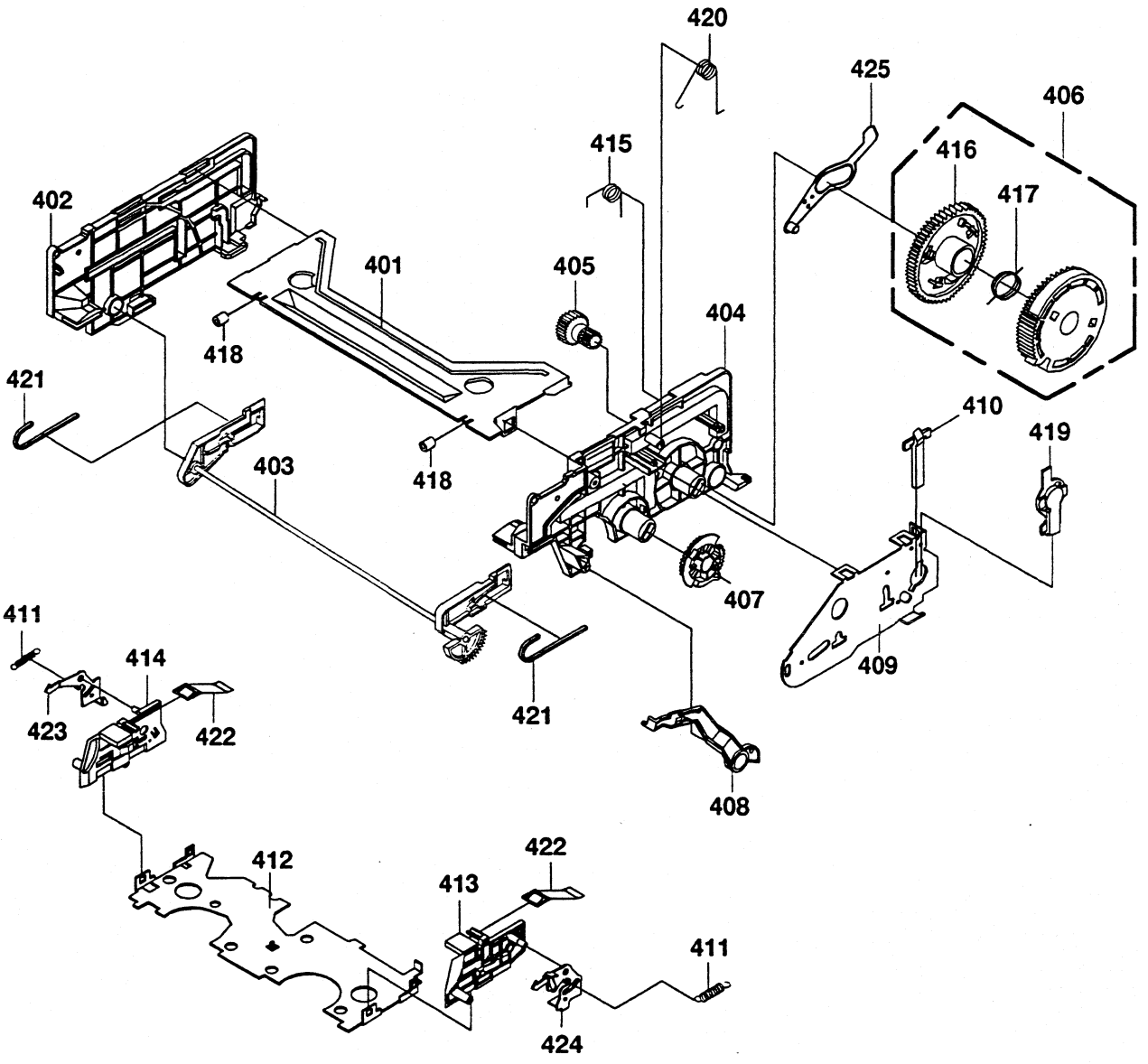
4-3471

CHASSIS EXPLODED VIEW (TOP VIEW)



4-3400

UNIT ASS'Y EXPLODED VIEW



ELECTRICAL REPLACEMENT PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
RESISTORS		
⚠ R512	R3X28A563J	R.METAL OXIDE 56K OHM 2W
⚠ R520	R3X181820J	R.METAL OXIDE 82 OHM 1W
⚠ R525	R3X181010J	R.METAL OXIDE 1.0 OHM 1W
⚠ R537	R635U22R2J	R.FUSE 2.2 OHM 1/2W
R1005	R00106103J	RC 10K OHM 1/6W
R1021	R00106221J	RC 220 OHM 1/6W
⚠ R1087	R635812R7J	R.FUSE 2.7 OHM 1W
CAPACITORS		
⚠ C504	P2222B104K	CMP 0.1 UF 250V
⚠ C505	CA3PF0KL3M	CC 0.0033UF 250V
⚠ C506	CA30309L3M	CC 0.0033UF 4KV
C508	E02TFH680M	CE 68 UF 400V
C509	C0J0B0612K	CC 100 PF 1KV B
C512	P312F5103J	CPP 0.01 UF 630V
C520	E0ELF0332M	CE 3300 UF 6.3V
C1007	CHG0SL4H1J	CC 22 PF 50V SL
C4107	E0E300221M	CE 220 UF 6.3V
SEMICONDUCTORS		
D501	D28T011E10	DIODE.SILICON 11E1TA1B2
⚠ D504	D410S1NB60	DIODE S1NB60
⚠ D506	D13TGMA020	DIODE.SILICON GMA-02-BT
D509	D1VT001320	DIODE.SILICON 1SS132T-77
D510	D23TDSK10E	DIODE.RECTIFIER DSK10E-BT
D511	D2BT0EG01C	DIODE.RECTIFER EG-01C
⚠ D512	D2BT0AK040	DIODE.SCHOTTKY BARRIER AK04V0
⚠ D513	D13TGMA020	DIODE.SILICON GMA-02-BT
⚠ D514	D28T1DQ090	DIODE.RECTIFIER 21DQ09-TA2B1
⚠ D515	D13TGMA020	DIODE.SILICON GMA-02-BT
D516	D13TGMA020	DIODE.SILICON GMA-02-BT
⚠ D517	D9JT01501B	DIODE.ZENER UZ-15BCB-TA
D518	D1VT001320	DIODE.SILICON 1SS132T-77
D519	D28T11DF20	DIODE.SILICON 11DF2-TA2B2
D521	D1VT001320	DIODE.SILICON 1SS132T-77
D524	D97U02R21B	DIODE.ZENER MTZJ2.2B T-77
D1001	0001300030	LED SLR-938C-4-AB
D1006	D1VT001320	DIODE.SILICON 1SS132T-77
D1007	D1VTB721Q0	DIODE.SCHOTTKY RB721Q
D1008	D1VT001320	DIODE.SILICON 1SS132T-77
D1009	D1VT001320	DIODE.SILICON 1SS132T-77
D1010	D28T011E10	DIODE.SILICON 11E1TA1B2
D1011	D28T011ES1	DIODE.SILICON 11ES1TA1
D1017	D1VT001320	DIODE.SILICON 1SS132T-77
D1018	D1VT001320	DIODE.SILICON 1SS132T-77
D1019	D1VT001320	DIODE.SILICON 1SS132T-77
D1020	D1VT001320	DIODE.SILICON 1SS132T-77
D1024	D28T011E10	DIODE.SILICON 11E1TA1B2
D1027	D97U06R21C	DIODE.ZENER MTZJ6.2C T-77
D1028	D28T011E10	DIODE.SILICON 11E1TA1B2
D4001	D97U01501C	DIODE.ZENER MTZJ15C T-77
D4510	D97U01501D	DIODE.ZENER MTZJ15 T-77
D4803	D1VT001320	DIODE.SILICON 1SS132T-77
D4804	D1VT001320	DIODE.SILICON 1SS132T-77
D5001	D1VT001320	DIODE.SILICON 1SS132T-77
D6301	D97U05R11C	DIODE.ZENER MTZJ5.1C T-77
⚠ IC501	I0Q90431L0	IC NJM431L
⚠ IC502	I0QA97810F	IC NJM7810FA
IC703	I3ED656490	IC SDA5649
IC1001	I50F5B018A	IC OECB018A
IC1002	I93J407123	IC LA7123
IC1003	IE1J031AA0	IC RE5VL31AA-TZC
⚠ IC1004	I05S07291S	IC TA7291S
IC1150	IC3D0C04C0	IC ST24C04CB1
IC4001	I05D31232N	IC TA1232N
IC4002	I05D08850A	IC TL8850AP
IC4101	I03FG7411M	IC LA7411M-TP-T
IC4801	I96D07023A	IC OEC7023A
IC5001	I03D772880	IC LA7288
IC6301	I03F071050	IC LA7105M-TP-T1
IC6302	I03S06358T	IC LA6358ST
IC6303	I0MI90574J	IC UPC574J-T
⚠ Q501	TBWT009260	TRANSISTOR.SILICON 2SB926(S,T)-AA
Q503	TC3T042040	TRANSISTOR.SILICON 2SC4204-AA
Q504	TNYJA05001	COMPOUND TRANSISTOR DTC143EKAT146
Q505	TNYJA05001	COMPOUND TRANSISTOR DTC143EKAT146
⚠ Q506	TCB0049080	TRANSISTOR.SILICON 2SC4908
⚠ Q509	TBWT009260	TRANSISTOR.SILICON 2SB926(S,T)-AA
⚠ Q511	0002500480	PHOTO COUPLER TLP621D4(GR)
⚠ Q513	TAWT0984K0	TRANSISTOR.SILICON 2SA984K-AA
Q1001	0002G00490	PHOTO COUPLER GP1S94

REF.NO.	PART NO.	DESCRIPTION
SEMICONDUCTORS (CONT.)		
Q1002	0000700320	TRANSISTOR.PHOTO RPT-38PB113
Q1003	TCYT2872S0	TRANSISTOR.SILICON 2SC2872S
Q1004	0000700320	TRANSISTOR.PHOTO RPT-38PB113
Q1006	0002G00490	PHOTO COUPLER GP1S94
Q1014	TN7TJ05001	COMPOUND TRANSISTOR DTC114TKT147
Q4001	T8YA2412K0	TRANSISTOR.SILICON 2SC2412KT147
Q4004	T8YA2412K0	TRANSISTOR.SILICON 2SC2412KT147
Q4005	T6YA1037K0	TRANSISTOR.SILICON 2SA1037KT147
Q4006	T8YA2412K0	TRANSISTOR.SILICON 2SC2412KT147
Q4007	T8YA2412K0	TRANSISTOR.SILICON 2SC2412KT147
Q4009	T8YA2412K0	TRANSISTOR.SILICON 2SC2412KT147
Q4010	T6YA1037K0	TRANSISTOR.SILICON 2SA1037KT147
Q4011	T6YA1037K0	TRANSISTOR.SILICON 2SA1037KT147
Q4012	T6YA1037K0	TRANSISTOR.SILICON 2SA1037KT147
Q4013	T8YA2412K0	TRANSISTOR.SILICON 2SC2412KT147
Q4015	T8YA2412K0	TRANSISTOR.SILICON 2SC2412KT147
Q4016	T8YA2412K0	TRANSISTOR.SILICON 2SC2412KT147
Q4101	T8YA2412K0	TRANSISTOR.SILICON 2SC2412KT147
Q4503	TAYT0933S0	TRANSISTOR.SILICON 2SA933STP(R,S)
Q4504	TNYJC05001	COMPOUND TRANSISTOR DTC124EKAT146
Q4505	T6YA1037K0	TRANSISTOR.SILICON 2SA1037KT147
Q4802	T6YA1037K0	TRANSISTOR.SILICON 2SA1037KT147
Q5004	TCKT013170	TRANSISTOR.SILICON 2SC1317-T
Q6303	T8YA2412K0	TRANSISTOR.SILICON 2SC2412KT147
Q6304	T82A037340	TRANSISTOR.SILICON 2SC3734
Q6305	T8YA2412K0	TRANSISTOR.SILICON 2SC2412KT147
Q6306	T8YA2412K0	TRANSISTOR.SILICON 2SC2412KT147
COILS & TRANSFORMERS		
⚠ L501	029X000070	COIL.LINE FILTER SS10V-03330
L504	021W66820K	COIL.CHOKE 82 UH
L505	021W66220M	COIL.CHOKE 22 UH
L701	021673101K	COIL 100 UH
L4001	02167D101K	COIL 100 UH
L4002	021673101K	COIL 100 UH
L4003	02167D101K	COIL 100 UH
L4004	021673101K	COIL 100 UH
L4005	021QA6471K	COIL 470 UH
L4006	021LA6470K	COIL 47 UH
L4008	021LA6560K	COIL 56 UH
L4009	021LA6560K	COIL 56 UH
L4012	021LA6390K	COIL 39 UH
L4013	021LA6330K	COIL 33 UH
L4101	021663101K	COIL 100 UH
L4503	021LA6220K	COIL 22 UH
L4504	021LA6390K	COIL 39 UH
L4507	021LA6100K	COIL 10 UH
L4509	021673101K	COIL 100 UH
L4510	021LA6100K	COIL 10 UH
L4804	021673101K	COIL 100 UH
L5005	021673102K	COIL 1000 UH
L6303	02167D101K	COIL 100 UH
⚠ T501	0481290054	TRANSFORMER.SWITCHING 8129005
T5001	03362601OR	COIL.BIAS OSC 3626010
JACK		
J4501	063G100037	SOCKET.21PIN 035 0 9985 05
SWITCHES		
SW601	0504201T31	SWITCH.TACT SKHVBE075B
SW603	0504201T31	SWITCH.TACT SKHVBE075B
SW604	0504201T31	SWITCH.TACT SKHVBE075B
SW605	0504201T31	SWITCH.TACT SKHVBE075B
SW606	0504201T31	SWITCH.TACT SKHVBE075B
SW607	0504201T31	SWITCH.TACT SKHVBE075B
SW651	0504101T36	TACT SWITCH EVQPC005K
SW652	0504101T36	TACT SWITCH EVQPC005K
SW1001	0550322004	SWITCH.LEAF HXW0394-010010
SW6301	0510U21022	SWITCH.SLIDE SSSF11342A
P.C. BOARD ASSEMBLIES		
PCB010	A4B414B01A	PCB ASS'Y VM6114A
PCB270	A4B414B27A	PCB ASS'Y VE6771B
PCB330	A4B406B33A	PCB ASS'Y VE6773A
MISCELLANEOUS		
BT601	1412004008	BATTERY.MANGAN R03(AB)E 20 T
⚠ CD501	1206655806	CORD.AC BUSH E2N 6FEET 06655806
CD601	06CH23041A	CORD.EIS CONNECTOR CH23041A

REF.NO.	PART NO.	DESCRIPTION
		MISCELLANEOUS (CONT.)
CP501	0694430100	CORD,UX CONNECTOR 2-173270-3
CP651	069E230129	CONNECTOR PCB SIDE 8283 0312
CD4102	0694220129	CONNECTOR PCB SIDE 173981-2
CD6002	06CZL05015	RF CABLE PAL FTZ D-2070
CP1001	06977K0580	CONNECTOR PCB SIDE TMC-W20P-A1
CP1002	0697150310	CONNECTOR PCB SIDE TAS-X05X-D1
CP4001	06977G0580	CONNECTOR PCB SIDE TMC-W16P-A1
CP4002	068122070A	CORD,EIS CONNECTOR 8122070A
CP4101	069R740479	CONNECTOR PCB SIDE 52492-0420
CP4102	069R750499	CONNECTOR PCB SIDE 52492-0520
CP4103	06977K0570	CONNECTOR PCB SIDE TMC-W20X-A1
CP4104	06977G0570	CONNECTOR PCB SIDE TMC-W16X-A1
CP4105	06977GM010	CONNECTOR PCB SIDE TKC-F09X-L1
CP4106	069R760018	CONNECTOR PCB SIDE 52044-0645
⚠ F501	080PT1R602	FUSE 21801.6
FH501	06710T0006	HOLDER,FUSE EYF-52BC
FH502	06710T0006	HOLDER,FUSE EYF-52BC
OS651	0771000013	REMOTE RECEIVER PNA4612M00YB
TM601	07660AN06C	TRANSMITTER SBER20039C
⚠ TU6001	0162601001	RF UNIT(MD+TU+IF) TMUG3-103A
V651	096775R703	TUBE FLUORESCENT DISPLAY FV686GA
X1001	100CA01603	CRYSTAL HC-49/U-S 16.0MHZ
X1002	100C32R803	CRYSTAL DSVT-200 32.768KHZ
X4001	100CA4R404	CRYSTAL HC-49/U-S 4.433619MHZ
X4801	100W17R702	CRYSTAL HC-49/U 17734.475KHZ

RESISTOR
RC.....CARBON RESISTOR

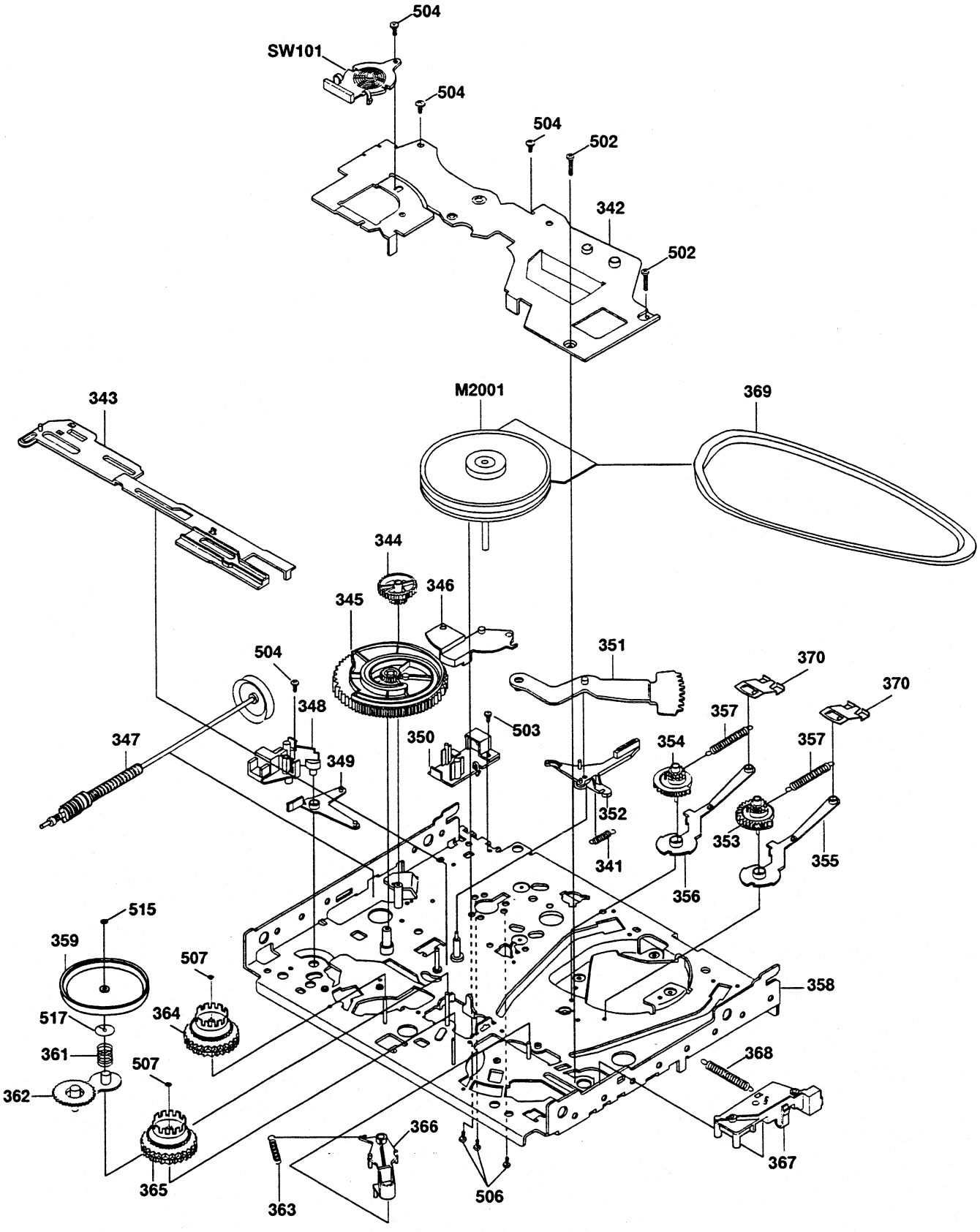
CAPACITORS
CC.....CERAMIC CAPACITOR
CE.....ALUMI ELECTROLYTIC CAPACITOR
CP.....POLYESTER CAPACITOR
CPP.....POLYPROPYLENE CAPACITOR
CPL.....PLASTIC CAPACITOR
CMP.....METAL POLYESTER CAPACITOR
CMPL.....METAL PLASTIC CAPACITOR
CMPP.....METAL POLYPROPYLENE CAPACITOR
CST.....STYROL CAPACITOR

CHASSIS/UNIT ASS'Y REPLACEMENT PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
301	850P600471	BRACKET.BRAKE
302	850P400358	ADJUST.TENSION
303	850A400122	TENSION BAND.ASS Y
304	850A400124	TENSION ARM ASS'Y
305	850A400123	TENSION LEVER 2 ASS'Y
306	850A600155	MAIN BRAKE S ASS'Y
307	850A600156	MAIN BRAKE T ASS'Y
308	850P800252	SPRING.MAIN BRAKE
309	850P900564	REFLECTOR.EOT
310	850P400411	REFLECTOR.LED 2
311	850P800269	SPRING.AC HEAD
312	850P500060	BASE.AC HEAD
313	850P000394	POST.CASS GUIDE L
314	850P800245	SPRING.AZIMUTH 2
315	850A500013	AHC ASS'Y
316	850A400102	GUIDE ROLLER ASS'Y
317	850A400114	BASE.S INCLINED ASS'Y
318	850A400115	BASE.T INCLINED ASS'Y
319	850P400330	CATCHER.S
320	850P400332	CATCHER.T
321	850P400343	CAM.PINCH.ROLLER
322	850P600487	BELT.LOADING
323	850A400117	PINCH ROLLER BLOCK
324	850P900541	CASS.OPENER
325	850P800264	SPRING.P5
326	850A400120	P5 ARM ASS'Y
327	850P400342	CAM GEAR
328	8146230A14	JOINT SCREW BIND M3*11
329	850P400344	CAM.P5
330	850P400356	SPRING.TENSION ARM 2
331	850P400357	SPRING.TENSION ARM 1
332	850P200216	REEL S
333	850P200217	REEL T
334	850P400402	CATCHER.P5 2
335	850P600465	SUB BRAKE S
336	850P800253	SPRING.S-S BRAKE
337	850P200247	ARM.JOINT
338	850P800262	SPRING.JOINT ARM
339	850A600157	SUB BRAKE T ASS'Y
340	850P800254	SPRING.T-S BRAKE
341	850P800255	SPRING.CAP BRAKE
342	850P600485	PLATE.BOTTOM
343	850A600176	ROD.MAIN ASS'Y
344	850P400341	GEAR.MIDDLE
345	850P600472	CAM.MAIN
346	850P600468	LEVER.MAIN BRAKE
347	850A600159	WORM ASS'Y
348	850P600483	BRACKET.WORM F
349	850P600474	LEVER.RATCHET
350	850P600484	BRACKET.WORM R
351	850P300151	LEVER.LOADING
352	850A600158	CAP BRAKE ASS'Y (S)
353	850P300152	GEAR.LOADING S
354	850P300153	GEAR.LOADING T
355	850A300053	LOADING ARM S ASS'Y
356	850A300054	LOADING ARM T ASS'Y
357	850P800263	SPRING.LOADING GEAR
358	850A000173	MAIN CHASSIS ASS'Y
359	850P200213	CENTER PULLEY
360	850P600486	PULLEY.LDM 5
361	850P800261	SPRING.C-PULLEY
362	850A200065	ARM IDLER ASS'Y
363	850P800270	SPRING.LEVER TENSION
364	850A200064	CLUTCH GEAR T ASS'Y
365	850A200063	CLUTCH GEAR S ASS'Y
366	850P400360	LEVER.TENSION
367	850P400359	HOLDER.TENSION
368	850P800256	SPRING.MAIN ROD
369	850P200215	BELT.CAPSTAN
370	850P300150	SLIDER.LOADING

REF.NO.	PART NO.	DESCRIPTION
401	850P900617	BRACKET.TOP
402	850P900607	BRACKET.SIDE L
403	850A900165	LINK ASSY
404	850P900615	BRACKET.SIDE R
405	850P900601	GEAR.JOINT
406	850P900602	GEAR.CAM
407	850P900609	GEAR.LINK R
408	850P900618	LEVER.FLAP 2
409	850P900616	BRACKET.SIDE R2
410	850P900621	REFLECTOR.BOT
411	850P800296	SPRING.LOCKER
412	850P900611	CASS HOLDER
413	850P900613	CASS.SIDE R
414	850P900612	CASS.SIDE L
415	850P800298	SPRING.BRACKET R
416	850P900608	GEAR.CLUTCH
417	850P800297	SPRING.CLUTCH
418	850P98A001	RUBBER.SILICON
419	850P900620	COVER.SENSOR BOT
420	850P800290	SPRING.EARTH
421	850P800294	SPRING.LINK
422	850P800299	SPRING.PACK
423	850P900605	LOCKER.L
424	850P900606	LOCKER.R
425	850P900610	LEVER.BOT
501	8110217401	SCREW.TAP TITE(P) BIND 1.7*4.0
502	8109226A64	SCREW.TAP TITE(B) BIND 2.6*16
503	8107226804	SCREW.TAP TITE(S) BIND 2.6*8
504	8107226604	SCREW.TAP TITE(S) BIND 2.6*6
505	8107123604	SCREW.TAP TITE(S) PAN 2.3*6
506	8109126804	SCREW.TAP TITE(B) PAN 2.6*8
507	82P166005N	POLYSLIDER WASHER(CUT) 1.6*6.0*T0.5
508	82Q3154B3N	POLYSLIDER WASHER 3.1*5.4*T0.13
509	810A130604	SCREW/WASHER(A) M3*6
510	810B126604	SCREW/WASHER(B) M2.6*6.0
511	8102130304	SCREW.PAN M3.0*3.0
512	8102126A04	SCREW.PAN M2.6*10
513	810A123504	SEMS A M2.3*5.0
514	850PAA0197	SCREW.MOTOR M3*5
515	82P266005N	POLYSLIDER WASHER(CUT) 2.6*6.0*T0.5
516	82Q264713N	POLYSLIDER WASHER 2.6*4.7*T0.13
517	82P26A005N	POLYSLIDER WASHER(CUT) 2.6*10*T0.5
CD1001	068722058A	CORD EIS CONNECTOR 8722058A
CD2001	122W060803	CORD JUMPER 2W060803
CD5001	122L051501	CORD JUMPER 2L051501
H5001	1523D91029	HEAD AUDIO CONTROL HVMZA1254A
H5002	1543D02010	HEAD.FULL ERASE HVFHF0059A
⚠ M101	1596P48001	MOTOR.LOADING MXN-13FB09C
⚠ M2001	1510398028	CAPSTAN DD UNIT F2QT827
⚠ M2003	1589V11003	MICRO MOTOR EP13CC
SW101	0520244003	MODE SWITCH SRZZ0B068B
⚠ UN4001	A4B406B500	CYLINDER UNIT ASS'Y A4B406B500

CHASSIS EXPLODED VIEW (BOTTOM VIEW)



4-3401

MECHANICAL REPLACEMENT PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
601	A4B4148720	CABINET,FRONT ASS'Y
602	701WPD0088	CABINET,FRONT
603	711WPD0421	PLATE,DISPLAY
604	712WPD0127	FLAP
605	735WPAA008	BUTTON,CHANNEL
606	735WPD0487	BUTTON,DECK
607	743WKAA001	SPRING,FLAP
608	800WFA0001	CUSHION,LEG
609	752WSA0108	SHIELD,HEAD AMP
610	762WSA0028	ANGLE,DECK BACK
611	850A900163	UNIT ASS'Y
612	702USS0023	CABINET,TOP
613	753WSA0103	SHIELD,DECK
614	----	HEAT SINK
615	761WSAA002	ANGLE,DECK
616	800WQ0A001	SHEET 18X15XT0.8
617	753WSA0095	SHIELD,CASE HEAD AMP
618	753WSA0094	SHIELD,COVER HEAD AMP
619	753WSA0098	PLATE,EARTH SYSCON
620	753WSA0099	PLATE,EARTH BOTTOM
621	743WKAA003	SPRING,FL EARTH
622	754WPA0015	COVER,LED(R)
623	754WPA0014	COVER,LED(L)
624	756WPAA001	HOLDER,CLOCK
625	761WPAA003	HOLDER,DECK
626	850P700031	HOLDER,LED
627	702WPA0377	PANEL,BACK
628	7222022320	SHEET,RATING
629	702WSA0033	PLATE,BOTTOM
630	7230006039	FILM,DECORATION
701	8117140A24	SCREW,TAPPING(BO) PAN 4*12
702	8117540A02	SCREW,TAPPING(BO) TRUSS 4*10
703	8117426802	SCREW,TAPPING(BO) OVAL 2.6*8
704	8107230604	SCREW,TAP TITE(S) BIND 3*6
705	8110226084	SCREW,TAP TITE(P) BIND 2.6*8
706	8107226604	SCREW,TAP TITE(S) BIND 2.6*6
707	8107226804	SCREW,TAP TITE(S) BIND 2.6*8
708	8107230804	SCREW,TAP TITE(S) BIND 3*8
709	8110630A04	SCREW,TAP TITE(P) BRAZIER 3*10
710	8110630804	SCREW,TAP TITE(P) BRAZIER 3*8
---	JB5X0300	POLYBAG
---	J3A20702	GUARANTEE CARD
---	J4B41401	INSTRUCTION BOOK
---	J4B41407	QUICK SET UP SHEET
---	791UHA0005	GIFT SHEET
---	792UHA0083	PACKAGE
---	793UCD0957	GIFT BOX